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FMC Corporation

Via Federal Express

February 3, 2011

Ms. Kira Lynch, MS ECL-113
US Environmental Protection Agency, Region 10
1200 Sixth Avenue
Seattle, WA 98101

Subject: Administrative Order on Consent for Supplemental Remedial Investigation/Feasibility Study for the FMC Plant Operable Unit
U.S. EPA Docket No. CERCLA 10-2004-0010
FMC Plant OU – Interim CERCLA 2009 Groundwater Monitoring Report

Dear Ms. Lynch:

Pursuant to FMC's April 2009 response to EPA comments on the Groundwater Current Conditions Report (GWCCR) for the FMC Plant OU, FMC agreed to document the interim CERCLA groundwater monitoring plan (which FMC has been conducting voluntarily) as an appendix to the SFS report. FMC prepared an Interim CERCLA Groundwater Monitoring Plan (ICGMP) that was submitted as Appendix G to the draft Supplemental Feasibility Study Report (draft SFS) on March 4, 2010. FMC submitted responses to EPA and support agency comments on the draft SFS, including comments on the ICGMP, on June 11, 2010. Following resolution of all comments, FMC submitted the final SFS Report, including the ICGMP as Appendix G, to EPA on July 30, 2010. As of this date, EPA has not approved the SFS Report nor independently approved the ICGMP. However, FMC has continued implementing its voluntary CERCLA groundwater monitoring program and is submitting the enclosed Interim CERCLA 2009 Groundwater Monitoring Report (GMR).

The Interim CERCLA 2009 GMR follows the format and content described in the ICGMP and is being submitted to provide continuity in reporting groundwater data for the FMC Plant OU since submittal of the GWCCR Final - June 2009. Due to the fact that EPA's comment to add well 151 into the interim CERCLA well network was received / implemented in the second quarter of 2010, no samples were collected or analyzed from well 151 during 2009 and thus are not included in the 2009 GMR.

FMC

FMC will target submittal of the Interim CERCLA 2010 GMR by April 15 as specified in the ICGMP. Please feel free to contact me at (215) 299-6700 should you have questions regarding this information.

Sincerely,

Barbara E. Ritchie
Associate Director, Environment
FMC Corporation

Enclosure (2 copies)

Cc: Sue Skinner, EPA (2 copies, 4 extra CDs)
Doug Tanner, IDEQ
Kelly Wright, Shoshone-Bannock Tribes
Susan Hanson, Shoshone-Bannock Tribes

INTERIM CERCLA
2009 GROUNDWATER MONITORING REPORT
FMC PLANT OPERABLE UNIT

Prepared for:

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February 2011

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1.0 INTRODUCTION

This Groundwater Monitoring Report (GMR) for 2009 presents the groundwater monitoring data for the Interim CERCLA groundwater monitoring program at the FMC Plant Operable Unit (OU) of the Eastern Michaud Flats Site located near Pocatello, Idaho, pursuant to the Draft Interim CERCLA Groundwater Monitoring Plan (GMP) for the facility (FMC, 2010a). Figure 1 presents a site map of the FMC Plant OU. FMC performs the groundwater monitoring activities identified in the GMP concurrently with FMC's ongoing RCRA and Calciner Pond Remedial Action groundwater monitoring programs at the plant site.

1.1 BACKGROUND

The FMC plant is included within the Eastern Michaud Flats (EMF) Superfund site, which was placed on the National Priorities List (NPL) on August 30, 1990. FMC has been conducting CERCLA groundwater monitoring in conjunction with its ongoing RCRA groundwater monitoring program and Calciner Pond Remedial Action groundwater monitoring program. The RCRA groundwater monitoring program began in 1991 at essentially the same time as the EMF site CERCLA Preliminary Site Characterization Study (PSCS) and Remedial Investigation (RI) groundwater investigations and monitoring. The Calciner Pond Remedial Action groundwater monitoring commenced during the second quarter of 2003 under the IDEQ-FMC voluntary consent order (VCO) for remedial action at the calciner ponds. FMC has been conducting its CERCLA groundwater monitoring program voluntarily since the EMF Site ROD was issued in 1998. Due to the fact that a Remedial Design / Remedial Action (RD/RA) Consent Decree to implement the FMC Plant OU groundwater remedy, including the long-term groundwater monitoring specified in the

1998 ROD, was never entered, a CERCLA groundwater monitoring plan had been neither required nor prepared.

Following permanent shut-down of the FMC plant in December 2001, EPA and FMC entered into an AOC for a Supplemental Remedial Investigation and Feasibility Study (SRI/SFS) at the FMC Plant Operable Unit (OU). Although the AOC and Statement of Work (SOW) for the FMC SRI/SFS did not require a supplemental groundwater investigation(s) at the FMC Plant OU, FMC recognizes the need to address groundwater (both EMF impacts identified during the EMF RI and the potential for future impacts) during the SFS for the FMC Plant OU. FMC prepared a Groundwater Current Conditions Report (GWCCR) for the FMC Plant OU (FMC, June 2009) as a compendium of the extensive EMF RI and post-RI groundwater investigations, results and evaluations to support the SFS for the FMC Plant OU. One of EPA's comments on the draft GWCCR was "FMC's voluntary CERCLA ground water monitoring program must make a transition as soon as possible into an interim ground water monitoring program that must be approved by EPA with the development of site specific DQO's. This interim program will continue until an amended ROD has been signed for FMC. Then a long-term ground water monitoring program will be developed once a remedy is selected." (EPA, February 2009).

During a series of EPA-FMC meetings during February, March and May 2009, FMC and EPA began moving forward toward development of both an interim and long-term CERCLA groundwater monitoring program for the FMC Plant OU. FMC recently finalized the Groundwater Current Conditions Report (GWCCR) for the FMC Plant OU (FMC, June 2009) and EPA approved the GWCCR by letter dated July 20, 2009. Consistent with EPA's direction, the interim CERCLA Groundwater Monitoring Plan was submitted as an appendix to the Draft SFS Report for the FMC Plant OU on March 4, 2010. Comments were received on the Draft SFS Report, including the CERCLA GMP, and the revised Final SFS report was submitted on July 30, 2010. The CERCLA GMP was included as Appendix G to the Final SFS.

1.2 FMC GROUNDWATER MONITORING PROGRAMS

A detailed description of the groundwater monitoring programs currently being implemented at the FMC Plant OU is presented in Section 2.0 of the Interim CERCLA GMP (FMC, 2010a). As noted previously, FMC has been conducting CERCLA groundwater monitoring on a voluntary basis, in conjunction with its ongoing RCRA and Calciner Pond Remedial Action groundwater monitoring programs. The voluntary CERCLA groundwater monitoring program has been conducted since the EMF Site ROD was issued in 1998. The RCRA groundwater monitoring program began in 1991 at essentially the same time as the EMF site CERCLA Preliminary Site Characterization Study (PSCS) and RI groundwater investigations and monitoring. The Calciner Pond Remedial Action groundwater monitoring commenced during the second quarter of 2003 under the IDEQ-FMC voluntary consent order (VCO) for remedial action at the calciner ponds.

A comprehensive review of site groundwater conditions was presented in the GWCCR (FMC, 2009), and is summarized in Section 2.3 of the Draft Interim CERCLA GMP (FMC, 2010a). Overall, the GWCCR concluded that the current spatial extent (as of 2009) of FMC-related groundwater impacts is comparable to that defined during the EMF RI in 1993-1994. Concentrations of FMC-related groundwater constituents in many areas of the plant site have decreased, and groundwater quality is expected to continue to improve due to the lack of continued solute loading and sustained hydraulic head on any identified or potential source areas at the site. The most significant factor in the reduction of groundwater constituent concentrations is advective mixing. Mixing of small volumes of EMF-affected groundwater with large volumes of unaffected groundwater within the EMF aquifer system substantially reduces the concentration of all constituents, including conservative, non-attenuating solutes such as sulfate, along the groundwater flowpath.

The objective of the Interim CERCLA groundwater monitoring program specified in the GMP (FMC, 2010a) is to collect sufficient data of known quality to, in conjunction with the RCRA and Calciner Pond remedial action groundwater monitoring programs, evaluate potential changes and/or trends in site-related groundwater constituents and to evaluate

groundwater conditions on an FMC Plant OU-wide basis. Based on the information collected and presented in the GWCCR, the Interim CERCLA, RCRA, and Calciner Pond Remedial Action groundwater monitoring programs provide appropriate spatial and temporal coverage of the FMC Plant OU to achieve this objective. The groundwater monitoring field and analytical parameters required by the Interim CERCLA GMP are focused on key parameters that define the extent of FMC-impacted groundwater, and are consistent with the RCRA and Calciner Pond Remedial Action groundwater monitoring programs. Finally, the data evaluation and reporting components of the Interim CERCLA GMP are designed to integrate with the evaluation and reporting components of the RCRA and Calciner Pond monitoring programs, in order to provide a complete depiction of site groundwater quality and trends.

1.3 OVERVIEW OF GMR CONTENTS

This GMR presents the groundwater data collected in 2009 pursuant to the Interim CERCLA GMP (FMC, 2010a). As stated in the GMP, this annual GMR contains the following information:

- A compilation of field sampling (e.g., water elevation levels) and laboratory analytical results for samples collected under the Interim CERCLA GMP;
- Characterization of groundwater flow rates and direction including FMC Plant OU-wide groundwater elevations displayed on groundwater isocontour maps, and updated hydrographs for the Interim CERCLA monitoring well network;
- An assessment of data quality and usability;
- An evaluation of groundwater quality, consisting of:
    - A qualitative summary of general chemistry results; and
    - Quantitative results of trend tests for arsenic, potassium, total phosphorus / orthophosphate, sulfate and selenium; and
- A comprehensive evaluation of potential changes and/or trends in site-wide groundwater at the FMC Plant OU, including results from the FMC Interim

CERCLA, RCRA, and Calciner Pond Remedial Action groundwater monitoring programs, and groundwater monitoring data from the adjacent J.R. Simplot Don plant as warranted.

Groundwater monitoring data (groundwater levels, field parameter measurements, and laboratory analytical results) and data validation and usability reports for the monitoring year are also provided with this report in electronic format.

The GMR is structured as follows:

Section 1 presents background information for the FMC facility and an overview of the current site groundwater monitoring programs.

Section 2 summarizes the Interim CERCLA groundwater monitoring program.

Section 3 presents and discusses groundwater flow for the FMC Plant OU, including flow direction, flow rate, and long-term groundwater elevation trends in the Interim CERCLA well monitoring network.

Section 4 summarizes data quality for the CERCLA well monitoring network groundwater data, as reported in Data Validation/Usability Summaries prepared following each monitoring event.

Section 5 presents groundwater quality data for 2009, and assesses trends in groundwater chemistry through the use of trend plots, intrawell Mann-Kendall tests for trend, and ion ratios.

Section 6 is a summary evaluation of OU-wide groundwater quality and trends, based on the results from the Interim CERCLA, RCRA, and Calciner Pond groundwater monitoring programs at FMC, as well as any relevant data collected at the adjacent J.R. Simplot Plant.

Section 7 summarizes the report findings.

Report references are in Section 8.

2.0 INTERIM CERCLA GROUNDWATER MONITORING PROGRAM

The Interim CERCLA groundwater monitoring program for the FMC Plant OU is detailed in the Draft Interim CERCLA GMP (FMC, 2010a), including the associated Field Sampling Plan (FSP), Quality Assurance Project Plan (QAPP), and Data Verification and Data Validation Protocol. This section of the GMR summarizes the key components of the GMP: monitoring locations, frequency, and analytical parameters. Specific procedures for well purging and sampling, sample documentation and handling, equipment decontamination, and other monitoring program considerations are detailed in the GMP.

2.1 INTERIM CERCLA MONITORING WELL NETWORK

Groundwater quality and flow characteristics within and adjacent to the FMC Plant OU are currently assessed through collection of groundwater elevation and water quality data at the following sixteen Interim CERCLA monitoring wells (along with wells monitored under the RCRA and Calciner Pond monitoring programs), as outlined in the GMP:

Area	Well Numbers	Up / Downgradient[1]
On-Plant Site	134, 139, 145, 159	D
Plant Site downgradient	110, 111, 146, TW-9S	D
Downgradient from the FMC and Simplot Plant sites	517, TW-12S	D
Northern perimeter	502, 515, 523, 524, 525, TW-11S	Cross

[1] Up / Downgradient refers to the wells hydrologic relationship to identified FMC and J.R. Simplot source areas.
[2] 'Impact' is in reference to detection of arsenic, nitrate or selenium above representative levels.

Monitoring well locations are shown on Figure 2. Because the three groundwater monitoring programs (CERCLA, RCRA and Calciner Pond) are coordinated, Figure 2 shows the CERCLA groundwater monitoring well network along with the RCRA and Calciner Pond groundwater monitoring well networks that are sampled for field and laboratory analyses. Lithologic and well construction logs for the Interim CERCLA monitoring wells are in

Appendix A-A of the Interim CERCLA FSP. Well completion details, including surveyed locations, measuring point elevations, total depths, and top of screen depths, are summarized in Table 1.

2.2 MONITORING FREQUENCY

2.2.1 Water Level Monitoring

FMC performs quarterly groundwater level (elevation) measurements at numerous monitoring wells that provide uniform coverage across the entire FMC Plant OU. The results of the site-wide water level monitoring have been and will continue to be collected and utilized under FMC's Interim CERCLA, RCRA and Calciner Pond groundwater monitoring programs. During each groundwater monitoring event, water level measurements are collected at the following wells:

- Wells 101 through 191 inclusive, consisting of 73 shallow and deep wells within the FMC "100-series" wells;
- TW-5S, TW-5I, TW-5D, TW-9S, TW-11S and TW-12S; and
- 501, 502, 503, 505, 514, 515, 516, 517, 518, 523, 524 and 525.

In addition to the 91 wells listed above, surface water elevations are measured in the Batiste Spring channel immediately below the overflow weir from the springhouse cistern and in the Swanson Road Spring (a.k.a., the Spring at Batiste Road) basin.

2.2.2 Water Quality Monitoring

The sixteen Interim CERCLA monitoring wells are sampled semi-annually, with sampling events targeted for the fall (usually November) and spring (usually May) of each year. In 2009, the Interim CERCLA monitoring wells were sampled semi-annually on May 14 - 20 (referred to as the May 2009 or 2Q2009 monitoring event) and November 5 - 6 and 30 (referred to as the November 2009 or 4Q2009 monitoring event).

As requested by EPA, FMC submitted on April 21, 2009 a plan for proposed modifications to its routine CERCLA groundwater monitoring plan and a special deep well monitoring

event ("FMC CERCLA Groundwater Monitoring Program, Modification to the Routine CERCLA Well Network and 2Q2009 Special Deep Well Monitoring Event, April 21, 2009"). In summary, FMC's April 21, 2009 plan included the following elements in addition to FMC's routine groundwater monitoring programs:

- Beginning with the 2Q2009 monitoring round, FMC added six existing monitoring wells to its routine CERCLA groundwater monitoring well network, specifically wells 134, 145, 159, 502, 517 and TW12S. These modifications were subsequently incorporated in the Interim CERCLA GMP (July 2010) and these routine results are presented and evaluated in this report.
- FMC performed a special monitoring event for 2Q2009 to sample and analyze deep (and paired shallow) wells in order to re-validate historical results.

EPA approved FMC's April 21, 2009 plan and proposed 2Q2009 CERCLA special sampling and analysis event by letter dated May 5, 2009. The special shallow/deep well pair groundwater monitoring event was conducted concurrently with the routine second quarter 2009 (2Q2009) RCRA, Calciner Ponds and FMC voluntary CERCLA groundwater monitoring programs during the period May 11 through 20, 2009. A description of the 2Q2009 special shallow/deep well pair groundwater monitoring event and results are contained in "FMC Groundwater Monitoring Programs, Summary of the Results for the 2Q2009 Groundwater Monitoring Event, July 30, 2009" (also transmitted to EPA on July 30, 2009) that is included as Appendix D of this report.

2.3 ANALYTICAL PARAMETERS

2.3.1 Field Parameters

Specific conductance (SC), dissolved oxygen (DO), water temperature, turbidity, oxidation-reduction potential (ORP), and pH measurements are collected in the field during well purging, in accordance with the Interim CERCLA GMP/FSP/QAPP. Field parameters are measured continuously in a flow-through cell, and are recorded at specified intervals during purging, with the exception of turbidity, which is measured on a separately collected sample aliquot at the specified intervals. A multiparameter field instrument with combination

pH/ORP electrode, SC probe, and temperature sensor was used during collection of groundwater samples in 2009. A nephelometer-type turbidimeter was used for turbidity measurements. All instruments were calibrated daily in accordance with manufacturers' recommendations.

2.3.2 Laboratory Analytical Parameters

The evolution of the laboratory analytical parameter list used for CERCLA groundwater samples at the FMC Plant OU is discussed at length in Section 3.4 of the Interim CERCLA GMP. In essence, a "reduced" or focused analytical parameter list has been used for routine semi-annual monitoring of CERCLA wells since 1994 following EPA approval. Periodic groundwater monitoring for "expanded" analytical parameter lists has been conducted by FMC at EPA's request. Analytical results for the routine and expanded groundwater monitoring through May 2008 are presented in the GWCCR (FMC, 2009). Consistent with the recommendations in the GWCCR, the routine Interim CERCLA groundwater monitoring for the FMC Plant OU specified in the GMP focuses on arsenic as the risk-driving groundwater constituent of concern (COC); the additional groundwater COCs fluoride, nitrate, and selenium; and the site-related indicator parameters potassium, total phosphorus / orthophosphate, chloride, and sulfate.

Additionally, periodic expanded monitoring events will include the other FMC Plant OU groundwater COCs manganese and vanadium that are localized within the broader FMC-related impact and the FMC Plant OU source related constituents ammonia, boron and total cyanide that are not significant risk-drivers. Elemental phosphorus is identified as a FMC Plant OU groundwater COC, but is localized and only consistently detected above its comparative value (CV) in monitoring wells 108 and 122. As these wells are already routinely (semiannually) sampled and analyzed for elemental phosphorus under FMC's RCRA groundwater monitoring program, elemental phosphorus is not separately specified as a parameter under the interim CERCLA groundwater monitoring program.

The routine and expanded Interim CERCLA groundwater monitoring laboratory analytical parameters are listed in Table 2, along with analytical method numbers, method descriptions, and required detection limits. As noted in the GMP (FMC, 2010a), the expanded monitoring is scheduled to be conducted every five years during the first semiannual (second quarter) monitoring event, beginning in 2012. During 2009, the interim CERCLA monitoring network wells were sampled and analyzed for the following routine parameters listed in Table 2:

- Common ions – chloride, potassium, and sulfate;
- Metals – arsenic and selenium; and
- Nutrients and Fluoride – fluoride, nitrate, and total phosphorus.

The samples were also analyzed for ammonia which was a parameter under FMC's voluntary CERCLA groundwater monitoring. However, given the preponderance of non-detected results from the CERCLA network wells, FMC did not propose further routine analysis of the CERCLA wells for ammonia under the Interim CERCLA GMP.

2.4 SPECIAL MAY 2009 CERCLA PROGRAM

As described in Section 2.2.2, FMC proposed modifications to its routine CERCLA groundwater monitoring plan that added monitoring of six (6) wells to the routine CERCLA monitoring well network and conducted a special deep well monitoring event. The additional routine wells and deep wells were analyzed for the same routine parameters and ammonia per the Section 2.3.2 bullet list above. A description of the 2Q2009 special shallow/deep well pair groundwater monitoring event and results are contained in "FMC Groundwater Monitoring Programs, Summary of the Results for the 2Q2009 Groundwater Monitoring Event, July 30, 2009" (also transmitted to EPA on July 30, 2009) that is included as Appendix D of this report.

3.0 GROUNDWATER FLOW

Depth to groundwater measurements (static water levels or SWLs) are collected at the FMC facility on a quarterly basis at a facility-wide set of monitoring wells, including the Interim CERCLA monitoring wells. Depths to groundwater are subtracted from surveyed monitoring well measuring point elevations to yield groundwater elevations across the site. Table 3 summarizes the depth to groundwater measurements and corresponding calculated groundwater elevations obtained for the interim CERCLA monitoring program wells in 2009. Field-measured water levels are also in the complete interim CERCLA groundwater database in Attachment 1. Fluctuations in groundwater elevation at individual CERCLA wells during 2009 were relatively minor and quite consistent, ranging from 0.49 feet at well 145 to 1.02 feet at well 523 (Table 3). The average water level fluctuation for the CERCLA wells in 2009 was 0.78 feet.

3.1 FLOW DIRECTION

Groundwater elevations for each 2009 quarterly data set have also been plotted and used to construct facility-wide potentiometric maps showing groundwater flow directions beneath the FMC Plant OU. Shallow groundwater potentiometric maps for February 2009 (Figure 3), May 2009 (Figure 4), August 2009 (Figure 5), and November 2009 (Figure 6) are included with this GMR.

A review of the 2009 quarterly potentiometric data in Figures 3 through 6 indicates that groundwater flow direction in the vicinity of the FMC Plant OU is consistent throughout the year, showing little seasonal variation. The 2009 groundwater elevation data and potentiometric maps show no significant changes from data collected in previous years. The groundwater flow direction suggested by the 2009 monitoring results in Figures 3 through 6 is consistent with the conclusions presented in the GWCCR (FMC, 2009), as follows:

- Northward flow from the western and central portions of the FMC Plant Site is limited to the area south of Interstate-86 by converging flow of groundwater from the west and northwest.

- Groundwater from the western and central portions of the FMC Plant Site is directed eastward, south of I-86, and joins groundwater from the joint fenceline / calciner ponds area and from the Simplot plant.
- In the joint fenceline / calciner ponds area, groundwater from the western part of the Simplot gypsum stack flows in a northwesterly sweeping arc across the Simplot property boundary and beneath FMC property, where it commingles with flows from the eastern portions of FMC, and exits from the plant boundaries to the northeast near well 110.
- Virtually all groundwater underflowing the EMF facilities discharges to the Portneuf River at Batiste Spring and Swanson Road Spring, and as bank seeps and baseflow to the river in the reach bounded by these springs.

3.2 HYDRAULIC GRADIENT

The potentiometric maps presented in Figures 3 through 6 also illustrate the variability in groundwater hydraulic gradients present beneath various portions of the FMC Plant OU. The patterns in hydraulic gradient exhibited by the 2009 data are consistent with historic patterns described and discussed in the GWCCR, including the following key features:

- **Joint Fenceline/Calciner Ponds (Bannock Range) Area**. Steep horizontal gradients are present in the Bannock Range area (represented by the far southeast portion of the site in the joint fenceline / calciner ponds area). As reported in the 2009 Calciner Pond Remedial Action GMR (FMC, 2010b), calculations based on February 2009 groundwater elevation data for Calciner Ponds monitoring wells 164 and 190 indicate a horizontal hydraulic gradient of approximately 0.03 in this portion of the FMC plant site.
- **Western Ponds (primarily Michaud Flats) Area**. In the western part of the water level monitoring network (the FMC western ponds area is primarily in the Michaud Flats groundwater regime), hydraulic gradients are much lower, and there is a slight northeast-trending trough in the groundwater surface extending through the area of wells 101, 168, and 140. Based on the February 2009 groundwater elevation data for

wells 101 and 140, a representative horizontal hydraulic gradient of 0.0004 can be assigned to this area.

- **Plant Site Downgradient Area**. There is a distinct increase in the horizontal gradient in the central and eastern portions of the plant site, from the area near plant site well 134 to downgradient well TW-9S, and a decreasing gradient further east in the vicinity of wells 517 and TW-12S (downgradient of both the FMC and Simplot plant sites). Near well 146, the hydraulic gradient is approximately 0.005 (based on February 2009 data from wells 146 and 110).
- **Area Downgradient of FMC and Simplot Plant Sites**. Downgradient of well 110 (based on February 2009 data from wells 110 and TW-12S), the hydraulic gradient decreases significantly to about 0.0002.

Note that these characteristic groundwater flow areas discussed in the GWCCR are distinct from the CERCLA monitoring areas presented in Section 2.1, which are used as a basis for the discussion of groundwater quality.

Overall, the groundwater elevation and hydraulic gradient data indicate that groundwater flow in the vicinity of the FMC Plant OU is controlled by the convergence and mixing of Bannock Range groundwater (flowing generally to the north under steep gradients) with Michaud Flats groundwater (flowing generally to the east and northeast under shallower gradients), with groundwater ultimately discharging to the Portneuf River near Batiste and Swanson Road Springs.

3.3 GROUNDWATER FLOW RATE

Groundwater flow rates (horizontal seepage velocities) for the shallow groundwater zone at the FMC Plant OU, calculated from hydraulic conductivities, horizontal gradients, and estimated porosities, are variable throughout the site. The GWCCR (FMC, 2009) cited seepage velocities of up to 12 feet per day (ft/day) in the Portneuf River area, 0.4 ft/day in the Bannock Range area, and from 1 to 11 ft/day in the Michaud Flats area. The variability of calculated seepage velocities in the Michaud Flats area is a consequence of both variable

hydraulic gradients and the wide range of hydraulic conductivities calculated for Michaud Flats wells during EMF RI aquifer tests.

Current estimates of groundwater flow rates in the shallow aquifer for various portions of the FMC Plant OU have been calculated using the following equation:

$$V = [(K)(i)]/n$$

where V = groundwater flow velocity (seepage velocity) (ft/day);
K = hydraulic conductivity (ft/day);
i = hydraulic gradient (dimensionless); and
n = porosity or specific yield (dimensionless).

As inputs to the groundwater flow equation, hydraulic gradients were estimated as cited above in Section 3.2; hydraulic conductivities for individual wells were obtained from Table 3.3-1 of the EMF RI (Bechtel, 1996) and spatial average values were calculated for groups of wells located within relevant areas of the FMC Plant OU showing different hydraulic gradients; and porosity was assumed to be 0.2 in all cases. Source data and results for groundwater flow calculations are given below for the plant site western ponds (Michaud Flats) area with low hydraulic gradient, the joint fenceline / calciner ponds (Bannock Range) area with high hydraulic gradient, the plant site downgradient area with intermediate hydraulic gradient, and the area downgradient of both the FMC and J.R. Simplot plant sites (transition to the Portneuf River), where hydraulic gradients again become very shallow.

3.3.1 Western Ponds (Michaud Flats) Area

Estimated groundwater flow velocity in the shallow groundwater zone at the western ponds area was calculated at 0.34 ft/day, as follows:

Shallow Well	K (ft/day) from EMF RI Table 3.3-1
104	126
113	397
126	166
134	309
135	89.3
139	53.9
140	275
148	69.5
154	49.3
Average	**171**

V = [(K)(i)]/n

K = 165 ft/day
i = 0.0004
n = 0.2

V = (171 ft/day)(0.0004)/0.2
V = 0.34 ft/day

3.3.2 Joint Fenceline / Calciner Ponds (Bannock Range) Area

Estimated groundwater flow velocity in the shallow groundwater zone at the joint fenceline / calciner ponds area was calculated at 1.6 ft/day, as follows:

Shallow Well	K (ft/day) from EMF RI Table 3.3-1
304	1.41
333	28.1
142	1.98
Average	**10.5**

V = [(K)(i)]/n

K = 10.5 ft/day
i = 0.03
n = 0.2

V = (10.5 ft/day)(0.03)/0.2
V = 1.6 ft/day

3.3.3 Plant Site Downgradient Area

Estimated groundwater flow velocity in the shallow groundwater zone at the plant site northern property boundary downgradient area (converging Michaud Flats and Bannock Range groundwater flow) was calculated at 5.2 ft/day, as follows:

Shallow Well	K (ft/day) from EMF RI Table 3.3-1
108	286
110	108
111	397
146	173
516	66
Average	**206**

V = [(K)(i)]/n

K = 188 ft/day
i = 0.005
n = 0.2

V = (206 ft/day)(0.005)/0.2
V = 5.2 ft/day

3.3.4 Area Downgradient of FMC and Simplot Plant Sites

Estimated groundwater flow velocity in the shallow groundwater zone in the area downgradient of the FMC and Simplot plant sites (transition to Portneuf River area) was calculated at 1.7 ft/day, as follows:

Shallow Well	K (ft/day) from EMF RI Table 3.3-1
502	394
503	4760
505	1038
517	2040
518	422
Average	**1731**

$V = [(K)(i)]/n$

$K = 1731$ ft/day
$i = 0.0002$
$n = 0.2$

$V = (1731 \text{ ft/day})(0.0002)/0.2$
$V = 1.7$ ft/day

3.4 GROUNDWATER ELEVATION HYDROGRAPHS

Long-term groundwater elevation trends at the sixteen interim CERCLA monitoring program wells are shown on the summary hydrographs in Figures 7 (On-Plant and Plant Site downgradient wells) and 8 (wells downgradient of the FMC and Simplot plant sites and Northern Perimeter wells). In most cases, groundwater levels have been measured quarterly at each well since installation, although certain wells have been removed from or added to the groundwater elevation monitoring program over time.

With the exception of a small number of anomalous data points (possibly related to measurement error or values skewed by well installation/development activities during initial monitoring), water levels have remained rather stable over the nearly 20 years of monitoring shown on Figures 7 and 8. Analysis of the Interim CERCLA well groundwater elevation data in Figures 7 and 8 shows that the average absolute change in elevation between monitoring events (i.e., the differences in elevation from one monitoring event to the next averaged over the period of record, without regard to whether the change is increasing or decreasing) ranges from 0.45 feet at well 517 to 1.18 feet at well 523, with an overall average for the sixteen CERCLA wells of 0.68 feet. Well 523 is the only well that shows an average change between consecutive monitoring events greater than 1 foot. The overall observed

variability in groundwater elevation (i.e., the difference between the maximum and minimum measured groundwater elevations over the period of record at individual wells) ranges from 1.08 feet at well 517 to 6.17 feet at well 515, with an average total variability of 4.52 feet. Thus, the groundwater elevation data for the CERCLA wells indicate that, on average, groundwater elevations typically change by less than 1 foot from one monitoring event to the next, and groundwater elevations at individual CERCLA wells have varied over a range of approximately 1 to 6 feet from 1991 through 2009.

No major long-term trends in groundwater elevation are evident on Figures 7 and 8. As noted in the GWCCR (FMC, 2009), seasonal water level fluctuations in Michaud Flats groundwater are likely associated with irrigation withdrawal and recharge patterns. Maximum groundwater elevations for most wells were generally observed in the mid- to late-1990s during a period of average and above average regional precipitation. Minimum elevations were typically observed in the 2001 - 2002 period, coinciding with several years of significantly below average regional precipitation. Water levels have slowly increased again in recent years, but generally have not recovered to levels observed in the 1990s. Groundwater elevations in the CERCLA wells do not show any discernable relationship to activities such as production well pumping from the deeper aquifer, the substantial decrease in pumping from FMC production wells following plant shutdown in 2001, or operation of the Simplot groundwater extraction system.

4.0 DATA QUALITY ASSESSMENT

All environmental data collected in association with the Interim CERCLA GMP is subject to a thorough data quality review and assessment process, matching the process currently used by FMC for its Calciner Pond RA and RCRA groundwater monitoring data. These data verification and validation efforts are based on procedures recommended in EPA guidance (EPA, 2002b). The Data Verification and Data Validation Protocol appended to the Interim CERCLA GMP (FMC, 2010a) describes how FMC has routinely adapted the specifications set forth in the National Functional Guidelines to non-CLP methods, the personnel that have been involved, the inputs to the process, sources of the inputs, how the process has been implemented, and the outputs of the process.

A Data Validation/Usability Summary Report is prepared by the data validation contractor (DVC) for each groundwater quality sampling event. This report summarizes the event, including when the samples were collected, what analyses were performed, what analytical methods were used, what procedures were used for the technical review, and what guidance and standards were used for the usability assessment. Laboratory reports are also attached to the Data Validation/Usability Summary Report. The data quality indicators assessed by the DVC are precision, accuracy, representativeness, comparability, completeness, and consistency. Copies of the Data Validation/Usability Summary Reports and the laboratory reports pertinent to the 2Q2009 and 4Q2009 Interim CERCLA monitoring well sampling and analysis are on the compact disc in Attachment 2.

The DVC performs a Level III data verification for these programs. Level III verification involves a review of all administrative documents, including field and laboratory chain-of-custody documents, sample preservation records, and sample preparation logs. For all precision and accuracy evaluations, laboratory summary information and forms are evaluated as indicated for the individual methods. Any observations from this process that may have potential impact on data utility or defensibility are narrated in the verification summary. Any actions or qualifications are also narrated and tabulated in the verification summary.

Groundwater samples were collected from the Interim CERCLA monitoring well network during the second quarter (May) and fourth quarter (November) of 2009. No data were formally rejected as unusable during the data verification and data validation process. The following sections offer a summary assessment of CERCLA groundwater data quality for 2009, based on the information reported in the applicable Data Validation/Usability Summary Reports (Attachment 2).

4.1 DATA QUALITY SUMMARY FOR 2Q2009 SAMPLES

The 2Q2009 (May 2009) groundwater samples from the sixteen Interim CERCLA monitoring wells (110, 111, 134, 139, 145, 146, 159, 502, 515, 517, 523, 524, 525, TW-9S, TW-11S, and TW-12S) were submitted to the laboratory as part of two Sample Delivery Groups (SDGs): CERCLAQ29A (Lots A9E160118 and A9E190162), and CERCLAQ29B (Lots A9E200179, A9E210133, and A9E220125). Results for individual data quality indicators for the 2Q2009 monitoring were reported as follows.

4.1.1 Precision

All precision criteria for field duplicates (co-located samples) and laboratory replicates were met. Results reported by the laboratory as less than the reporting limit (RL), but greater than the instrument detection limit (IDL) or method detection limit (MDL) were qualified by the laboratory with a B flag, and in the database (Appendix A and Attachment 1) with a J flag (estimated).

4.1.2 Accuracy

Matrix spike/matrix spike duplicate recoveries exceeded control limits (75-125%) for chloride, phosphorus, and selenium. Associated sample results were flagged as estimated low (J-) for these parameters. ICP serial dilution results for potassium and phosphorus indicated potential high bias, and associated sample results were flagged estimated high (J+). Low level calibration standards for arsenic and phosphorus showing high recoveries resulted in J+ (high bias) flags on several sample results. The DVC noted that flagged results “are considered usable when the bias factors are taken into account.”

4.1.3 Representativeness

Arsenic, selenium, phosphorus, and ammonia-N were reported at concentrations that generated an action level in one or more preparation, calibration, or field blanks. Associated results less than the applicable action level were flagged U (not detected at the reported values). The DVC commented that the flagged results "are considered usable as maximum potential concentrations," and therefore can be considered conservative estimates.

4.1.4 Comparability

All project criteria were met, since compliance with all applicable and required methods was achieved.

4.1.5 Completeness

The completeness for the 2Q2009 monitoring event was 100%, since all planned data were obtained and deemed usable.

4.1.6 Consistency

Data appeared generally consistent with historically observed concentration ranges. The formal statistical significance of any groundwater quality trends is beyond the scope of the data quality review, and is conducted as part of the evaluation of groundwater quality and trends (Sections 5 and 6).

4.2 DATA QUALITY SUMMARY FOR 4Q2009 SAMPLES

The 4Q2009 (November 2009) groundwater samples from the sixteen Interim CERCLA monitoring wells (110, 111, 134, 139, 145, 146, 159, 502, 515, 517, 523, 524, 525, TW-9S, TW-11S, and TW-12S) were submitted as part of two Sample Delivery Groups (SDGs): CERCLAQ49A (Lots A9K060455 and A9K070414), and CERCLAQ49B (Lot A9L010459). Results for individual data quality indicators for the 4Q2009 monitoring were reported as follows.

4.2.1 Precision

All precision criteria for field duplicates (co-located samples) and laboratory replicates were met. Results reported by the laboratory as less than the reporting limit (RL), but greater than the instrument detection limit (IDL) or method detection limit (MDL) were qualified by the laboratory with a B flag, and in the database (Appendix A and Attachment 1) with a J flag (estimated).

4.2.2 Accuracy

Matrix spike/matrix spike duplicate recovery criteria were met for all samples. Laboratory control samples and calibration standards were also all within control limits for the pertinent SDG and Lots. One CRI sample (fortified blank) for selenium showed an elevated recovery, resulting in J+ flags (estimated high) applied to selenium results for two samples.

4.2.3 Representativeness

Ammonia-N and fluoride were reported at concentrations that generated action levels in field equipment (fluoride) and pour (ammonia-N) blanks. Selenium was reported in a calibration blank at a concentration that generated an action level. These detectable results resulted in adjustment of values reported for some samples to "not-detected at the reported value" (U flag). The DVC commented that the flagged results "are considered usable as maximum potential concentrations," and therefore can be considered conservative estimates.

4.2.4 Comparability

All project criteria were met, since compliance with all applicable and required methods was achieved.

4.2.5 Completeness

The completeness for the 4Q2009 monitoring event was 100%, since all planned data were obtained and deemed usable.

4.2.6 Consistency

The formal statistical significance of any groundwater quality trends is beyond the scope of the data quality review, and is conducted as part of the evaluation of groundwater quality and trends (Sections 5 and 6).

5.0 EVALUATION OF INTERIM CERCLA WELL GROUNDWATER QUALITY AND TRENDS

Groundwater quality results for the 2009 monitoring events at the Interim CERCLA monitoring wells are shown in the groundwater quality tables in Appendix A. Results are shown for the semiannual May 2009 (second quarter) and November 2009 (fourth quarter) monitoring events, along with data qualifiers applied during the Data Verification and Data Validation process described in Section 4. A complete database of all groundwater quality data for the Interim CERCLA monitoring wells (Microsoft Excel format) is provided on the attached compact disc (Attachment 1).

The GWCCR (FMC, 2009) presented a comprehensive overview of groundwater quality, trends, and contaminant source areas throughout the FMC Plant OU based on the cumulative results and findings (through 2008) of the numerous groundwater investigations and monitoring programs conducted at the site. The discussion of groundwater quality and trends presented here for the Interim CERCLA monitoring well network builds upon the analysis and interpretations provided in the GWCCR.

As specified in the Interim CERCLA GMP (FMC, 2010a), quantitative evaluations (statistical tests for trend) will be performed on the CERCLA well network to evaluate whether there are upward parameter trends in individual wells within these areas on the site:

- On-Plant Site wells: 134, 139, 159 and 145 (in the joint fenceline area);
- Plant Site downgradient wells: 111, 146, 110 and TW-9S;
- Wells downgradient from the FMC and Simplot Plant sites: 517 and TW-12S; and
- Northern perimeter wells: 523, 515, 502, TW-11S, 524 and 525.

A qualitative assessment of field and laboratory parameter results for the 2009 CERCLA well monitoring is provided below in Section 5.1, and a quantitative (statistical) evaluation of trends for key FMC-related groundwater constituents (arsenic, potassium, phosphorus,

selenium, and sulfate) is in Section 5.2. For continuity, both the qualitative and quantitative evaluations of CERCLA well groundwater quality are presented on a well-specific basis and in terms of the four areas (well groups) described in the Interim CERCLA GMP (FMC, 2010a). A comprehensive (integrated) discussion of OU-wide groundwater quality for the FMC Plant, utilizing the output from FMC's RCRA and Calciner Pond Remedial Action monitoring programs is subsequently presented in Section 6.0.

5.1 2009 INTERIM CERCLA WELL GROUNDWATER DATA SUMMARY

In addition to the 2009 groundwater quality data for the Interim CERCLA monitoring wells presented in Appendix A, general groundwater quality information for the Interim CERCLA monitoring wells is summarized in Table 4 and in the boxplots in Appendix B. Table 4 shows the range of parameter concentrations observed during 2009 in the Interim CERCLA program wells for all sixteen wells and for the four separate site areas defined above. The boxplots summarize the overall data distribution (period of record through 2009) and relative concentrations for the key water quality indicator parameters arsenic, potassium, phosphorus, selenium, and sulfate at individual CERCLA monitoring wells. Boxplots show the median concentration (horizontal line within the box), 25^{th} and 75^{th} percentile concentrations (lower and upper ends of the box), and minimum and maximum values (lowermost and uppermost horizontal lines), and are arranged by CERCLA site area.

As described in Sections 2.2.2 and 2.4 above, beginning with the 2Q2009 monitoring round, FMC added six existing monitoring wells to its routine CERCLA groundwater monitoring well network, specifically wells 134, 145, 159, 502, 517 and TW12S. These modifications were subsequently incorporated in the Interim CERCLA GMP and these routine results are presented and evaluated in this report. The special shallow/deep well pair groundwater monitoring results are contained in "FMC Groundwater Monitoring Programs, Summary of the Results for the 2Q2009 Groundwater Monitoring Event, July 30, 2009" (also transmitted to EPA on July 30, 2009) that is included as Appendix D of this report and are not discussed in the qualitative and quantitative evaluations presented below.

5.1.1 On-Plant Site Wells

As shown in Table 4, water quality in the On-Plant Site wells 134, 139, 145, and 159 is highly variable as expected due to the source areas that influence the chemistry at these wells. Well 139 is downgradient from the old phossy ponds 3E through 6E, wells 159 and 134 are downgradient from and primarily influenced by releases from former Pond 8S, and well 145 is located in the joint fenceline area and is influenced by historic FMC sources and the Simplot gypsum stack. A review of the results in Appendix A indicates that well 145 (joint fenceline area) showed the highest concentrations of total arsenic and selenium, sulfate, and specific conductance observed in 2009, along with the lowest pH. Well 139 (old phossy ponds 3E-6E) showed the highest concentrations of nitrate and chloride, with selenium concentrations only slightly lower than those at well 145. Wells 134 and 159 (former Pond 8S) showed the highest concentrations of potassium, ammonia-N, and total phosphorus (Appendix A).

As described in greater detail in the GWCCR (FMC, 2009), elevated concentrations of FMC-related groundwater constituents in the On-Plant Site CERCLA wells is attributed to a combination of sources:

1. The “old phossy ponds” located throughout the southeastern portion of the Western Ponds area;
2. Former (unlined) Pond 8S located in the same area as the old phossy ponds; and
3. The Simplot gypstack, the former unlined calciner ponds and the former unlined kiln scrubber and kiln scrubber overflow ponds in the Joint Fenceline area.

Parameter concentrations observed in 2009 groundwater samples from the On-Plant Site CERCLA wells were consistent with the groundwater concentration (isocontour) maps presented in the GWCCR (FMC, 2009). Elevated sulfate, nitrate, and selenium concentrations at well 139 appear to be associated with old phossy ponds 3E through 6E. Elevated ammonia concentrations are observed in well 159, along with mildly reducing conditions (negative ORP measurements; see Appendix A). A number of wells downgradient of former Pond 8S contain ammonia at elevated concentrations, while further

downgradient ammonia concentrations decrease to below detection limits, oxidizing groundwater conditions are observed (positive ORP measurements) and nitrate concentrations increase, indicating that ammonia associated with reducing groundwater conditions at former Pond 8S is oxidized to nitrate as groundwater migrates downgradient. At well 134, elevated potassium and nitrate concentrations (Appendix A) occur within the area of groundwater impacts associated with former Pond 8S.

CERCLA well 145 is located in the northern portion of the Joint Fenceline area, where northward-trending Bannock Range groundwater flow from the Simplot gypstack and FMC calciner pond area initially commingles with the eastward-trending Michaud Flats groundwater flow from the Western Ponds area (see Figures 3 through 6). As described in the GWCCR (FMC, 2009) and in the 2009 Calciner Ponds Remedial Action GMR (FMC, 2010b), groundwater in this area is characteristically elevated in arsenic, selenium, sulfate, and phosphorus, and shows a lower pH than other portions of the facility, consistent with the results observed in 2009 for well 145. Based on ion ratios and the spatial distribution of parameters in groundwater (typically concentrations decrease away from the eastern FMC property line toward the west), the Simplot gypstack appears to be the primary source of sulfate, phosphorus, and arsenic to groundwater, and a source (although not the primary source) of selenium in the vicinity of well 145. The GWCCR (FMC, 2009) notes that the former kiln scrubber and kiln scrubber overflow ponds in the Central Plant area were a primary source of selenium to groundwater near well 145.

5.1.2 Plant Site Downgradient Wells

Groundwater quality for 2009 at the FMC Plant Site Downgradient wells 110, 111, 146, and TW-9S is summarized in Table 4. As expected based on historic data, the concentrations observed were lower (and pH higher) and in a narrower range than the On-Plant Site wells. For example, groundwater pH in these four wells ranged from 6.94 to 7.17, specific conductance values ranged from 1145 to 1484 µmhos/cm, and sulfate concentrations ranged from 124 to 213 mg/L in 2009 (Appendix A). Arsenic and selenium concentrations were highest at well 110 in 2009, consistent with the boxplot summaries for these constituents in

Appendix B. Nitrate concentrations in 2009 ranged from 4.2 to 9.8 mg/L (Table 4), and were highest at wells TW-9S and 111 (8.2 to 9.9 mg/L). Elevated potassium concentrations are also present in groundwater at the Plant Site Downgradient wells, with 2009 concentrations ranging from approximately 20 mg/L at well 110 to 50 mg/L at well TW-9S.

The period of record boxplot summaries in Appendix B for the Plant Site Downgradient wells generally reflect the concentration relationships shown by the 2009 groundwater data (Appendix A). As noted previously, arsenic and selenium concentrations are typically highest at well 110, and potassium concentrations are highest at well TW-9S; these relationships were also apparent during 2009. A comparison of the 2009 data with the boxplots does indicate that, in the majority of cases, the concentrations of key indicator parameters (arsenic, potassium, phosphorus, selenium, and sulfate) observed in 2009 were near the low end of the overall historical range (i.e., the lower end of the boxplot). Further discussion of key indicator parameter trends is presented in Section 5.2 below.

The 2009 data for the Plant Site Downgradient wells are also consistent with the spatial distribution of constituents in groundwater presented on the concentration isocontour maps in the GWCCR (FMC, 2009). Well 110, furthest to the east and exhibiting elevated arsenic, selenium, and sulfate concentrations, appears to be influenced by a combination of sources from the Joint Fenceline area (the Simplot gypstack and/or former unlined calciner ponds) and from the FMC Central Plant and Western Ponds areas. Wells 111, 146, and TW-9S are located further to the west (Figure 3); at these wells, concentrations of FMC-related groundwater constituents such as arsenic, selenium, potassium, sulfate, nitrate, and phosphorus are still readily discernable from background or representative concentrations, but all show the same general spatial distribution. As noted in the GWCCR (FMC, 2009), concentrations of these parameters “decrease as impacted groundwater migrates through the central plant area toward the northeast.”

5.1.3 Wells Downgradient from the FMC and Simplot Plant Sites

Two wells (517 and TW-12S) comprise the Interim CERCLA group of wells downgradient of both the Simplot and FMC plant sites. For most constituents, the 2009 data for well 517 indicate higher concentrations than well TW-12S, and in some cases concentrations are appreciably higher, particularly specific conductance, potassium, and chloride (Appendix A). Fluoride and phosphorus concentrations, conversely, were much higher at well TW-12S than at well 517 in 2009. The total phosphorus concentrations measured at well TW-12S in 2009 (11.3 and 4 mg/L) exceeded those at well 517 (0.584 and 0.7 mg/L) by an order of magnitude; nevertheless, the TW-12S phosphorus concentrations were near the lower end of the historically observed range shown on the period of record phosphorus boxplot in Appendix B. In fact, comparison of the Appendix B boxplots with the 2009 summary tables in Appendix A also show that, similar to the FMC Plant Site Downgradient wells discussed in Section 5.1.2, concentrations of the key FMC-related indicator parameters (that are also Simplot-related constituents) in the wells downgradient of the Simplot and FMC Plant sites in 2009 were near the lower end of the historic range. For example, potassium concentrations at well 517 in 2009 (37.9 to 39.2 mg/L) are near the minimum value of the potassium boxplot for well 517 in Appendix B, and substantially below the period of record median concentration of about 90 mg/L.

The 2009 groundwater data for wells 517 and TW-12S is consistent with the groundwater concentrations maps and associated interpretation presented in the GWCCR (FMC, 2009). Concentrations of numerous FMC-related constituents (and Simplot-related constituents) including potassium, sulfate, nitrate, phosphorus, arsenic, and selenium are elevated in one or both of these wells. The GWCCR notes that, as impacted groundwater from the Western Ponds and Joint Fenceline areas migrates northeast and downgradient from the northern boundary of the FMC Plant Site, groundwater flow lines merge and turn easterly in the area north of Highway 30 (in the vicinity of wells 517 and TW-12S). Based on a review of both EMF RI data and recent data reported by Simplot for their monitoring well network, concentrations of nitrate and phosphorus at well TW-12S are likely influenced by the Simplot source(s) impacting groundwater in the area of Simplot well 320.

5.1.4 Northern Perimeter Wells

The Northern Perimeter wells (502, 515, 523, 524, 525, and TW-11S) are included in the set of "sentry wells" described in the GWCCR (FMC, 2009) as "a series of wells that historically and currently are on the fringe or outside of the EMF-impacted groundwater area." The wells form a "fence" to the north of the EMF site extending from well 523 (north of the Western Ponds area) to well TW-11S (north of the Simplot plant) and to wells 524 and 525 north of Batiste Spring (Figure 2).

Table 4 shows the range of groundwater constituent concentrations observed in the Northern Perimeter wells during 2009, and the historic concentration distribution for individual wells is visually demonstrated on the boxplots in Appendix B. Groundwater constituent concentrations in 2009 remained consistent with historic results for these wells. As expected, EMF-related constituent concentrations of phosphorus, potassium, arsenic, and selenium remained below representative (background) concentrations in the Northern Perimeter wells (Table 5).

The boxplot summaries for key indicator parameters in Appendix B show the general concentration relationships among the Northern Perimeter wells. For arsenic and selenium, median concentrations for all six wells are quite similar, and are at or below 0.005 mg/L. The majority of selenium concentrations at these wells have been below the laboratory reporting limit. Occasional outliers have been observed for arsenic, including values greater than the 0.01 mg/L groundwater MCL at wells TW-11S (three results) and 525 (one result). Potassium concentrations in Northern Perimeter wells are consistently in the range of about 3 to 10 mg/L. Phosphorus concentrations are typically low, but have occasionally been reported near or above concentrations of 1 mg/L (Appendix B); in 2009, however, concentrations ranged from 0.027 to <0.10 mg/L (Table 4).

Median sulfate concentrations for wells TW-11S, 502, 523, 524, and 525 are slightly variable but similar (about 40 to 70 mg/L), but consistent with historic results the sulfate concentration at well 515 is higher than other Northern Perimeter wells. The sulfate

concentrations at well 515 in 2009 (133 to 148 mg/L) were about 2-3 times as high as those at other Northern Perimeter wells (45 to 78 mg/L). As discussed in the GWCCR (FMC, 2009), the overall groundwater chemistry at well 515 does not suggest that the well is EMF-impacted, since the elevated sulfate concentration is not accompanied by elevated concentrations of any other key indicator parameters. The elevated sulfate at well 515 may reflect natural variability in representative sulfate levels or may be a result of agricultural practices on the parcels neighboring this well.

The Interim CERCLA GMP (FMC, 2010a) includes the following provision for comparison of Northern Perimeter well groundwater quality results to representative concentrations as part of the annual GMR:

> "The results for the northern perimeter monitoring wells 502, 515, TW-11S, 524 and 525 that historically have shown minimal or no impact from FMC sources to groundwater will be compared to the representative (or background) concentrations and comparative values (CVs) for the FMC Plant OU. The groundwater representative concentrations and CVs were assembled and presented in Table 4.2-1 of the GWCCR. The representative concentrations and CVs for the interim CERCLA groundwater monitoring routine and expanded parameters are shown on Table 4-1 [of the GMP]. The comparison of monitoring results to the representative concentrations and CVs will be used to assess the status of these wells (e.g., remain unimpacted or indication of impact)."

Table 5 compares the 2009 monitoring results for wells 502, 515, 524, 525, and TW-11S with the representative (background) concentrations and CVs. As shown in Table 5, several 2009 monitoring results exceeded representative values; however, none of these exceedances are considered as evidence indicative of EMF impacts. The few observed exceedances for chloride, specific conductance, and fluoride (as well as the sulfate concentration at 502) exceed the representative concentrations by a relatively small percentage. Sulfate concentrations at well 515 were discussed above, and the overall groundwater chemistry at 515 does not suggest an EMF impact to this well. The elevated chloride, fluoride and sulfate

may reflect natural variability in background levels or may be a result of agricultural practices on the parcels neighboring this well.

Overall, the 2009 groundwater quality data from the Interim CERCLA monitoring wells were consistent with previous data and with the spatial distribution of groundwater constituents presented in the GWCCR (FMC, 2009). A quantitative statistical analysis of groundwater quality trends in the Interim CERCLA wells is in Section 5.2.

5.2 INTERIM CERCLA WELL GROUNDWATER QUALITY TRENDS

Trend plots for the key indicator parameters (total arsenic, potassium, selenium, orthophosphate, and sulfate) are provided in Appendix C. Also included in Appendix C are trend plots for pH and specific conductance, which have been included to allow for a visual assessment of general water quality trends and an evaluation of potential data inconsistencies or outliers. The trend plots show concentration trends through 2009 for each well, with all wells for a particular Interim CERCLA well group shown on a single plot.

In addition to trend plots, and in accordance with the GMP, the Mann-Kendall test for trend was used to evaluate the presence or absence of statistically significant trends in the indicator parameters arsenic, potassium, selenium, orthophosphate, and sulfate in all Interim CERCLA monitoring wells. Given the history of releases to groundwater from former unlined ponds, source control actions (e.g., pond closures) have resulted in improvements in groundwater quality at the EMF site, and the stated objective of the Interim CERCLA monitoring program to "evaluate potential changes and/or trends in site-related groundwater constituents," the data initially selected for statistical trend analysis at the Interim CERCLA wells consisted of all data collected since (and including) 2002. This time period (2002 through the most recent monitoring event) was also used for the evaluation of trends as part of the GWCCR (FMC, 2009), with the intent of focusing on "recent" trends while still capturing sufficient data points for a meaningful test.

Guidance documents for the statistical analysis of groundwater data typically include recommendations for a minimum number of data points for statistical analysis; recent guidance from EPA and IDEQ offers suggestions of 8 to 10 data points (EPA, 2009) and 12 data points (IDEQ, 2009). Due to variable frequency of monitoring, some of the Interim CERCLA monitoring wells do not include sufficient data for meaningful statistical testing within the 2002 through 2009 time period. Therefore, additional criteria were established to ensure that trend testing could be conducted for each parameter at each well with a similar level of confidence:

- A minimum of 12 data points (n=12) was set as the preferred minimum sample size for Mann-Kendall testing.
- Data for the 2002 through 2009 time period were reviewed; if this period included 12 or more data points, then these data were used for trend testing.
- If the 2002 through 2009 time period did not include 12 data points, the data set was expanded to include the most recent 12 data points (i.e., data points prior to 2002 were added to give a total of 12).
- Finally, for wells with a complete historical data set smaller than 12 data points, the entire data set was included for Mann-Kendall testing.

The Mann-Kendall test for trend is recommended as a robust non-parametric test for trends in data over time (Helsel and Hirsch, 2002; Gilbert, 1987), and is also recommended by the recent Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities (EPA, 2009) as a useful method for "detection monitoring" applications, particularly when groundwater populations are not "stable over time." The test is suitable for data that do not follow a normal distribution, and supports multiple observations per time period. As specified in the GMP, Mann-Kendall trend tests were conducted at the 95% confidence level. The results of the Mann-Kendall trend tests for the Interim CERCLA monitoring wells are in Table 6.

5.2.1 Visual Assessment of pH and Specific Conductance Trends

A qualitative review of the CERCLA well trend plots for the general water quality parameters pH and specific conductance (SC) in Appendix C does not reveal any visually apparent trends, with the exception of decreasing trends in SC at three Plant Site Downgradient wells (TW-9S, 110, and 111). The Interim CERCLA wells have exhibited stable pH values over the period of record, while SC values are more variable but without apparent trend. In many cases, the presence or absence of recent trends (i.e., within the last 5 to 10 years) are difficult to ascertain due to the relatively few data points available during that time period. However, overall the most recent pH and SC data generally falls within the historically observed range.

The decreasing SC trends for wells TW-9S, 110, and 111 occurred from about 2000 through 2006, and have recently stabilized (Appendix C). Anomalously elevated SC values were observed for all the Plant Site Downgradient wells in May 2008; the indicator parameter trend plots for these wells do not show similar spikes, so it is assumed that this anomaly may be related to variability in the field measurement of SC. Well TW-12S, downgradient of the FMC and Simplot Plant sites, has shown a great deal of variability in SC over the period of record, from about 500 to greater than 2500 µmhos/cm, but no long-term trend. The variability in SC at TW-12S appears to be largely but not entirely seasonally related (higher SC in the fall/winter and lower SC in the spring/summer).

5.2.2 Mann-Kendall Trend Test Results for Indicator Parameters

The Mann-Kendall trend test results in Table 6 indicate that the following wells/parameters exhibit statistically significant trends:

<u>On-Plant / Joint Fenceline Area Wells</u>

- Well 134: increasing trends for potassium and sulfate
- Well 139: increasing trends for selenium and sulfate
- Well 145: decreasing trends for potassium and selenium, and increasing trend for sulfate
- Well 159: increasing trends for arsenic, potassium, and phosphorus

Plant Site Downgradient Wells

- Well 110: decreasing trends for all five indicator parameters
- Well 111: decreasing trends for arsenic, potassium, phosphorus, and sulfate
- Well 146: increasing trends for arsenic, phosphorus, and sulfate, decreasing trend for potassium and selenium
- Well TW-9S: decreasing trend for potassium

Wells Downgradient of FMC and Simplot Plant Sites

- Well 517: no trends
- Well TW-12S: decreasing trends for arsenic, potassium, selenium, and sulfate

Northern Perimeter Wells

- Well 502: decreasing trend for sulfate
- Well 524: decreasing trend for arsenic
- Well TW-11S: decreasing trends for potassium and sulfate

As noted previously, some of the Interim CERCLA wells do not have the preferred minimum number of data points (12) during the 2002 through 2009 time period for a meaningful statistical trend test. The data set used for trend testing at these wells was therefore expanded to include data prior to 2002, in order to increase the number of data points for statistical testing to twelve, or to the maximum number available if less than twelve, as follows:

- Well 134: data from January 1998-2009 were used to give 12 data points;
- Well 145: all available data (June 1992-2009) were used to give 10 data points;
- Well 159: data from October 1997-2009 were used to give 12 data points;
- Well TW-9S: data from November 1998-2009 were used to give 12 data points;
- Well TW-11S: data from May 1998-2009 were used to give 12 data points;
- Well TW-12S: data from November 1998-2009 were used to give 12 data points;
- Well 502: data from January 1998-2009 were used to give 12 data points;

- Well 517: all available data (August 1993-2009) were used to give 10 data points; and
- Well 523: data from May 1999-2009 were used to give 12 data points.

All other wells were tested using data from 2002 through 2009. The number of data points and the date range used for Mann-Kendall testing for each parameter and well is shown in Table 6. In addition, for the purposes of Mann-Kendall testing, all nondetect values in the database were replaced with half the associated nondetect value, including both values reported as not detected by the laboratory, and values subsequently qualified as nondetected by the DVC. Field duplicate results were averaged for statistical calculations.

The following discussion of indicator parameter water quality trends for each of the CERCLA groundwater well groups is based on both the Mann-Kendall results for the well-specific time period, and the period-of-record time-concentration plots in Appendix C.

5.2.2.1 On-Plant / Joint Fenceline Area Wells

The increasing potassium and sulfate trends at well 134 identified by the Mann-Kendall test for the 1998 through 2009 time period are also visually apparent on the trend plots (Appendix C), although the sulfate trend is quite modest. However, both potassium and sulfate at 134 are currently within their overall historic concentration ranges. The increasing Mann-Kendall trend from 1998 through 2009 may be at least partially a result of the 2001 to 2008 temporal gap in results, given the contrast with the stable or decreasing trends for these parameters observed prior to 1998 on the trend plots in Appendix C.

The increasing selenium and sulfate trends at well 139 identified by the Mann-Kendall test for the 2002 through 2009 time period are also indicated on the trend plots (Appendix C). Although recent concentrations are lower than the peak selenium and sulfate concentrations observed in 2000 and 2001, the 2002 through 2009 trends do appear to be a continuation of longer-term slight increasing trends for selenium and sulfate, based on the period-of-record trend plots in Appendix C.

The decreasing potassium and selenium trends and the increasing sulfate trend at well 145 identified by the Mann-Kendall test for the 1992 through 2009 time period are apparent on the trend plots (Appendix C); however, parameter trends for well 145 are somewhat difficult to assess due to the relatively large temporal gaps in available results (from 1994 through 2003). Nevertheless, the increasing sulfate trend does not appear to be due to a short-term spike(s) in sulfate concentrations at this well.

The increasing arsenic, potassium and phosphorus trends at well 159 identified by the Mann-Kendall test for the 1997 through 2009 time period are indicated on the trend plots (Appendix C). As with wells 134 and 145, however, potential trends are difficult to assess due to the temporal gap in results. The 2009 arsenic, potassium and phosphorus results may represent a short term spike in concentrations as has been observed at other on-plant wells (for example, the May 2009 arsenic result at well 145). For arsenic, phosphorus, and selenium at well 159, elevated concentrations during the May 2009 monitoring event were followed by decreases to more typical concentrations during the November 2009 monitoring event (Appendix A and Appendix C).

Identified trends are further reviewed in the integrated water quality discussion and source evaluation in Section 6.0.

5.2.2.2 Plant Site Downgradient Wells

The significant improvements in water quality (statistically decreasing indicator parameter concentrations) for wells 110 and 111 implied by the Mann-Kendall results for 2002 through 2009 are clearly apparent in the Appendix C trend plots. The variable trends at well 146 (increasing arsenic, phosphorus, and sulfate, decreasing potassium) over the same time period are also visible, although the well 146 trends appear to be less dramatic. The trends at wells 110 and 111 have been relatively consistent since about the mid- to late-1990s, and have continued during the recent period (2002 - 2009). The increasing arsenic, phosphorus and sulfate trends and decreasing potassium and selenium trends at well 146, on the other hand, seem to be a more recent phenomenon, having commenced in about 2001 (Appendix

C). With the exception of selenium at well 110, overall the indicator parameter concentrations at wells 111, 110 and 146 appear to be converging within the same range.

The decreasing Mann-Kendall potassium trend at TW-9S for the 1998 through 2009 time period, and the period of record trend plots in Appendix C show that indicator parameter trends at TW-9S track fairly closely with the decreasing concentrations trends at wells 110 and 111, during both the recent period and the overall historical period. Identified trends are further reviewed in the integrated water quality discussion and source evaluation in Section 6.0.

5.2.2.3 Wells Downgradient of FMC and Simplot Plant Sites

As noted in Section 5.2.2, the two wells downgradient of the FMC and Simplot Plant sites (TW-12S and 517) did not have sufficient associated data during the 2002 through 2009 time period to conduct meaningful Mann-Kendall trend tests. Therefore, additional historical data was used to perform the test: data from 1993 through 2009 was used for statistical testing of well 517 trends, and data from 1998 through 2009 was used for statistical testing of well TW-9S trends. The test results (Table 6) indicate no significant trends at well 517, and decreasing arsenic, potassium, selenium and sulfate trends at well TW-12S.

The indicator parameter trend plots for 517 and TW-9S in Appendix C show little evidence of trends at well 517 but do show some evidence of decreasing trends at well TW-12S from 1998 through 2009. As noted previously for other wells with variable monitoring frequencies, overall parameter trends for well 517 are difficult to assess due to the gap in available results from 1999 through 2007. The data gap for well TW-12S is smaller (2003 through 2006), but still lends some uncertainty to the interpretation of trends. Arsenic concentrations at well TW-12S have always been variable, ranging from about 0.01 to 0.08 mg/L; recent data has consistently been at the lower end of this range (Appendix C), supporting the Mann-Kendall trend test result. The most recent (2009) results for potassium at well 517 were below 50 mg/L, compared with concentrations of about 60 to 100 mg/L prior to 2009 (Appendix C), suggesting a possible decreasing trend; however, the trend was

not statistically significant (Table 6). The variable indicator parameter concentrations at these wells are consistent with the variable SC values noted above. Identified trends are further reviewed in the integrated water quality discussion and source evaluation in Section 6.0.

5.2.2.4 Northern Perimeter Wells

No significant Mann-Kendall trend test results for indicator parameters were identified at Northern Perimeter wells 515 (2002 through 2009 time period), 523 (1999 through 2009), or 525 (2002 through 2009). Data for well 502 (1998 through 2009) showed a statistically significant decreasing trend for sulfate; well 524 (2002 through 2009) showed a significant decreasing trend for arsenic, and well TW-11S (1998 through 2009) showed significant decreasing trends for potassium and sulfate (Table 6).

The statistical trend test results are supported by the trend plots in Appendix C, which show stable or mildly decreasing concentrations over time, with occasional anomalies (spikes) such as the elevated arsenic, phosphorus, and sulfate concentrations at well 525 in May 2006. Overall, the Mann-Kendall tests and trend plots indicate no increasing trends in parameter concentrations in Northern Perimeter wells.

6.0 INTEGRATED GROUNDWATER QUALITY AND SOURCE EVALUATION

One of the objectives Interim CERCLA groundwater monitoring program is to evaluate any changes and/or trends in groundwater conditions on an OU-wide basis for the FMC Plant OU. Therefore, this section of the GMR discusses the groundwater quality and trends observed for the Interim CERCLA monitoring well network (Section 5.0) with reference to pertinent data obtained through the other two primary groundwater monitoring programs currently being implemented at the site, the RCRA and Calciner Pond monitoring programs. This integration of groundwater quality results is based on the evaluations (decision rules) outlined in Section 4.4.3 of the Interim CERCLA GMP and the project QAPP (Attachment B to the GMP). These decision rules are reproduced here for reference as follows:

> If upward trends are detected for any parameter and well(s), additional evaluation will be performed to assess the cause and source of the upward trend(s). The additional evaluation(s) will rely on the qualitative and quantitative data evaluations from all of the groundwater monitoring programs, including Simplot's, as follows:
>
> **On-Plant Site wells**: Any upward trend(s) at well 139, 134 and/or 159 will be compared to the results from the RCRA annual assessment report to assess whether the trends are related to releases from the closed RCRA ponds or more likely related to the former unlined phossy ponds in the western ponds area. Any upward trend(s) at well 145 will be compared to the results from the Calciner Pond annual groundwater monitoring report to assess whether the trend(s) is consistent with trends observed at the other wells in the joint fenceline area.
>
> **Plant Site downgradient wells**: Any upward trend(s) at well 111, 146 and/or TW-9S will be compared to the results from the RCRA annual assessment report to assess whether the trends are related to releases from the closed RCRA ponds or more likely related to the former unlined phossy ponds in the western ponds area. Any upward trend(s) at well 110 will be compared to the results from the Calciner

Pond annual groundwater monitoring report to assess whether the trend(s) is consistent with trends observed at the other wells in the joint fenceline area.

Wells downgradient from the FMC and Simplot Plant sites: Any upward trend(s) at well 517 and/or TW-12S will be compared to the results from the RCRA, Calciner Pond and Simplot groundwater monitoring results to assess the likely cause and source of the increasing trend.

Northern perimeter wells: Any upward trend(s) at well 523, 515, 502, TW-11S, 524 and 525 will first be assessed to determine if the trends are related to undetected results at higher detection limits. If the trends are not related to elevated undetected results, the current year concentrations will be compared to the comparative value (CV) per Table 4-1 of the GMP to determine whether there is an indication that the well could be impacted by the EMF Site or other non-EMF source(s). If the result(s) exceed the CV, the results will be compared to the concentration and trend(s) observed at the nearest cross-gradient well(s) within the EMF-impacted area to assess whether the changes are EMF related or more likely related to non-EMF sources.

6.1 ON-PLANT / JOINT FENCELINE AREA WELLS

Well 139 has exhibited recent increasing selenium and sulfate trends, as evidenced by the Mann-Kendall trend test results. This well is located in the Western Ponds area of the FMC Plant site, in the area downgradient of RCRA waste management units (WMUs) 9 (former Pond 9E), 3 (Former Pond 15S), and 8 (Phase IV Ponds), as well as the former unlined phossy ponds (Figure 2). A review of the results of the RCRA monitoring and statistical analysis for these WMUs, as reported in the 2009 RCRA Groundwater Monitoring Assessment (GMA) (FMC, 2010c), suggests that selenium concentrations at well 139 are likely influenced by mobilization of selenium from former unlined pond 3E. RCRA well 168, located immediately upgradient of well 139, also shows statistically significant increasing selenium concentrations. As noted in the 2009 RCRA GMA (FMC, 2010c), well 168 is located within the footprint of former pond 3E, an identified source of potassium,

selenium, sulfate, nitrate and phosphorus to groundwater beneath the Western Ponds area. The runoff from the RCRA covers at the adjacent Phase IV ponds into the topographically lower areas to the north (portions of former pond 3E) may be creating artificially high infiltration through this and other old ponds and additional mobilization of pond-related constituents through the vadose zone into groundwater. The additional mobilization of old pond-related constituents (e.g., common ions, nutrients, arsenic and selenium) could account for the trends observed in well 168, and at nearby downgradient well 139.

Mann-Kendall trend test results showed increasing trends for arsenic, potassium and phosphorus at well 159 and for potassium and sulfate at well 134 (Table 6). Wells 159 and 134 are located downgradient of former Pond 8S and its downgradient wells 155, 156, and 157, in the area where the highest concentrations of potassium and phosphorus, along with high concentrations of arsenic and sulfate are found in groundwater at the FMC Plant site (FMC, 2009). The 2009 RCRA GMA (FMC, 2010c) did not identify any current ongoing releases from former Pond 8S using statistical testing at wells 155, 156, and 157. The 2009 concentrations of phosphorus and potassium at wells 159 and 134, while elevated, remain much lower than concentrations at the Pond 8S downgradient wells 155, 156, and 157. Therefore, based on these results and the concentration maps presented in the GWCCR (FMC, 2009), it is likely that the arsenic, potassium, phosphorus and sulfate trends observed at wells 159 and 134 simply reflect ongoing plume migration from historic groundwater impacts associated with former Pond 8S and other former unlined phossy ponds in Western Pond area of the FMC Plant Site.

The decreasing potassium and selenium trends at well 145 are consistent with the decreasing trends at Calciner Pond downgradient monitoring well 136, located upgradient of well 145, as reported in the in the 2009 Calciner Pond GMR (FMC, 2010b). The increasing sulfate trend at well 145 is consistent with the increasing sulfate trends noted in the 2009 Calciner Pond GMR (FMC, 2010b) for Calciner Pond monitoring wells 142, 161, 164, 136, 189, and 190, all located upgradient of well 145. Prominent increasing sulfate trends are observed in wells both upgradient and downgradient of the FMC calciner pond area, and have been

attributed primarily to influence from the Simplot gypstack, as evidenced by ion ratios (FMC, 2010b). The increasing sulfate trend at well 145 is likely related to the trends observed in the Calciner Pond monitoring wells.

6.2 PLANT SITE DOWNGRADIENT WELLS

Mann-Kendall trend test results showed increasing trends for arsenic, phosphorus, and sulfate at Plant Site Downgradient well 146. Examined in detail, these trends are uniform, in that the concentration increases observed are relatively small (arsenic increased from about 0.015 to about 0.025 mg/L, phosphorus from about 0.4 to 0.9 mg/L, and sulfate from about 100 to 130 mg/L from 2002 through 2009), and all began in approximately 2001, having been more or less stable prior to 2001 (Appendix C). The 2009 RCRA GMA (FMC, 2010c) gives no indication that the trends at well 146 might be related to releases from RCRA WMUs on the site; no recent releases of arsenic are suggested by the RCRA statistical analyses.

In general, the concentrations of arsenic, phosphorus, and sulfate at well 146 appear to be approaching the concentrations observed at nearby well 111, which has shown consistently decreasing concentrations as attenuation of the groundwater plume originating in the Western Pond area continues. The recent increasing trends in arsenic, phosphorus, and sulfate may be related to the regional drought (below average precipitation) that generally persisted during the 2000 through 2006 period, and the resultant decrease in recharge and mixing with Bannock Range groundwater and/or to slight changes in groundwater flowpaths. The current concentrations at well 146 appear to be converging with current concentrations at the other Plant Site Downgradient wells (110, 111, and TW-9S), and remain similar to or lower than concentrations at these wells (Appendix C).

6.3 WELLS DOWNGRADIENT OF FMC AND SIMPLOT PLANT SITES

Decreasing Mann-Kendall trends for arsenic, potassium, selenium and sulfate were found for well TW-12S (Table 6). The decreasing trends at well TW-12S likely reflect source control actions and resultant decreased source loading from FMC (e.g., replacement of the former unlined calciner ponds with lined calciner ponds, Pond 8S closure) and Simplot (closure of

the former east overflow pond) and the recent data (2008 and 2009) may reflect influence from Simplot's implementation of their groundwater remedial action.

6.4 NORTHERN PERIMETER WELLS

No increasing trends for indicator constituents were indicated based on the Mann-Kendall trend tests conducted for the Northern Perimeter wells (502, 515, 523, 524, 525, and TW-11S). Therefore, no additional evaluation of causes or sources has been performed.

7.0 SUMMARY AND CONCLUSIONS

Groundwater monitoring data collected from the Interim CERCLA monitoring wells in May and November 2009 have been reviewed and evaluated in accordance with the Interim CERCLA GMP. The major conclusions of this GMR, as detailed above, include the following:

1. Fluctuations in measured groundwater elevations at individual CERCLA wells during 2009 were relatively minor and quite consistent, ranging from 0.49 feet at well 145 to 1.02 feet at well 523, and averaging 0.78 feet. The 2009 groundwater elevation data indicated flow directions and gradients consistent with historic data, as summarized in the GWCCR (FMC, 2009). Overall, the groundwater elevation and hydraulic gradient data indicate that groundwater flow in the vicinity of the FMC Plant OU is controlled by the convergence and mixing of Bannock Range groundwater (flowing generally to the north under steep gradients) with Michaud Flats groundwater (flowing generally to the east and northeast under shallower gradients), with groundwater ultimately discharging to the Portneuf River near Batiste and Swanson Road Springs.

2. Groundwater flow velocities calculated based on 2009 groundwater elevation data and previously estimated values for hydraulic conductivity and aquifer porosity ranged from a minimum of 0.34 ft/day in the Western Ponds area to a maximum of 5.2 ft/day in the Plant Site Downgradient area.

3. The 2009 CERCLA data were reviewed by the project Data Validation Coordinator in accordance with the Level III data verification protocols specified in the GMP. A minor percentage of 2009 results were qualified as estimated based on the data review; however, no data were formally rejected as unusable during the data verification and data validation process.

4. A qualitative review of 2009 CERCLA groundwater data for four well groups (On-Plant Site wells, Plant Site downgradient wells, wells downgradient from the FMC and Simplot Plant sites, and Northern Perimeter wells) showed the magnitude and

spatial distribution of key water quality indicator parameters observed throughout the FMC Plant OU in 2009 were consistent with the comprehensive groundwater quality overview presented in the GWCCR.

5. Comparison of Northern Perimeter well 2009 groundwater quality results with representative (background) concentrations and comparative values showed a few exceedances (for chloride, specific conductance, sulfate, and fluoride at wells 502 and 515). Based on the overall groundwater chemistry, however, none of these exceedances are considered as evidence indicative of EMF impacts.

6. Statistical tests for trend (Mann-Kendall) were conducted on representative arsenic, potassium, phosphorus, selenium, and sulfate data sets for each of the CERCLA wells. Along with inspection of trend plots for these parameters, the statistical testing results indicated increasing trends for eleven parameters at five wells, including potassium and sulfate at well 134; selenium and sulfate at well 139; sulfate at well 145; arsenic, potassium, and phosphorus at well 159, and arsenic, phosphorus, and sulfate at well 146. No increasing trends were noted at any of the wells downgradient of the FMC and Simplot Plant sites, or the Northern Perimeter wells.

7. Groundwater quality results for the CERCLA wells were integrated with the results obtained through the other two primary groundwater monitoring programs currently being implemented at the site, the RCRA and Calciner Pond monitoring programs, to evaluated any changes and/or trends in groundwater conditions on an OU-wide basis. Based on this review, increasing parameter trends in the On-Plant wells are likely related to previously identified mobilization of indicator constituents from various sources in the Western Ponds and Joint Fenceline areas, including former unlined pond 3E (impacting well 139), former pond 8S and other former unlined phossy ponds (impacting wells 134 and 159), and the Simplot gypstack (impacting well 145). Increasing parameter trends in Plant Site Downgradient well 146 show that concentrations in this well appear to be converging with current concentrations at the other Plant Site Downgradient wells (110, 111, and TW-9S), and remain similar to or lower than concentrations at these wells. These relatively recent increasing trends at

well 146 could be related to the regional drought (below average precipitation) that generally persisted during the 2000 through 2006 period, and the resultant decrease in recharge and mixing with Bannock Range groundwater, and/or to slight changes in groundwater flowpaths.

8.0 REFERENCES

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TABLES

TABLE 1. INTERIM CERCLA MONITORING WELL CONSTRUCTION SUMMARY

Well ID	Northing	Easting	Elevations (FTMSL^)						Well Diameter (inches)
			Top of Riser Casing	Top of Screen	Bottom of Screen	Bottom of Well	Bottom of Borehole	Groundwater Surface*	
110	558,378.9	453,398.7	4450.57	4364.30	4354.30	4351.80	4347.80	4384.49	4
111	556,296.9	452,890.2	4468.04	4374.00	4364.60	4361.80	4356.30	4393.15	4
134	555,354.2	451,636.8	4478.93	4374.50	4365.00	4362.20	4361.00	4395.36	4
139	553,167.0	450,368.1	4467.66	4377.90	4373.70	4370.30	4303.30	4396.64	4
145	557,552.3	452,188.7	4478.26	4347.00	4337.00	4334.50	4327.00	4392.38	4
146	557,382.2	453,214.1	4459.30	4367.90	4352.90	4350.40	4349.40	4390.09	4
159	554,680.1	451,036.0	4491.79	4381.30	4371.30	4368.30	4364.00	4396.18	4
502	558,079.5	454,363.3	4441.30	4375.10	4370.10	4367.30	4365.30	4384.44	4
515	555,307.3	454,045.1	4450.35	4379.10	4369.10	4366.10	4364.30	4393.72	4
517	558,812.8	453,747.0	4444.45	4377.10	4367.10	4364.10	4363.00	4384.27	4
523	552,513.7	452,001.4	4452.98	4375.80	4365.80	4365.30	4360.80	4396.83	4
524	560,768.0	455,307.0	4399.92	4348.90	4338.90	4338.40	4275.40	4382.78	4
525	560,772.1	455,296.9	4399.61	4379.30	4369.30	4368.80	4368.60	4382.84	4
TW-9S	559,985.0	454,775.0	4426.24	4377.00	4367.00	4367.00	4367.00	4385.63	6
TW-11S	559,785.0	453,975.0	4436.28	4381.00	4373.00	4373.00	4373.00	4383.95	6
TW-12S	557,413.1	453,819.7	4450.23	4373.00	4369.00	4369.00	4269.00	4384.21	6

^ Feet Above Mean Sea Level

* Measured November 2009.

TABLE 2. INTERIM CERCLA GROUNDWATER MONITORING ANALYTICAL PARAMETER LIST

Parameter	Method Number	Method Type	Method Detection Limit (ppm)
ROUTINE SEMIANNUAL AND EXPANDED 5-YEAR GROUNDWATER MONITORING EVENTS			
Potassium	6010B (a)	Inductively Coupled Plasma Atomic Emission Spectrometry	0.1
Chloride	9056 (b) or 325.3 (c)	Ion Chromatography or Titrimetric	1
Fluoride	9056 (b) or 340.2 (c)	Ion Chromatography or Potentiometric, Ion Selective Electrode	0.1
Metals (As, Se)	6010B (a)	Inductively Coupled Plasma Atomic Emission Spectrometry	0.002, 0.0005
Nitrate	9056 (b) or 353.2 (d)	Ion Chromatography or Colorimetric	0.1
Total Phosphorus	6010B (a) or 365.2 (c)	Inductively Coupled Plasma / Mass Spectrometry or Colorimetric (ascorbic acid)	0.02
Sulfate	9056 (b) or 375.4 (d)	Ion Chromatography or Turbidimetric	1
ADDITIONAL PARAMETERS – EXPANDED 5-YEAR GROUNDWATER MONITORING EVENTS			
Metals (Mn, B and V)	6010B (a)	Inductively Coupled Plasma Atomic Emission Spectrometry	0.0006, 0.018, 0.002
Total Ammonia (NH_3 + NH_4 as N)	350.3 (d)	Potentiometric, Ion Selective Electrode	0.2
Total Cyanide	335.4 (d)	Colorimetric	0.01

(a) Analysis may also be performed using method 6020, both 6010B and 6020 from Test Methods for Evaluating Solid Waste, EPA SW–846, Third Edition, Update IIIB (EPA, 2002a), as revised through 2002.

(b) Test Methods for Evaluating Solid Waste, EPA SW–846, Third Edition, Update IIIB (EPA, 2002a), as revised through 2002.

(c) Methods for the Chemical Analysis of Water and Wastes (MCAWW) (EPA/600/4-79/020) (EPA, 1983).

(d) Methods for the Determination of Inorganic Substances in Environmental Samples (EPA/600/R-93/100) (EPA, 1993).

TABLE 3.
INTERIM CERCLA MONITORING WELLS
2009 GROUNDWATER ELEVATIONS

Well	Measuring Point Elevation	February-09		May-09		August-09		November-09		2009 Overall Fluctuation in GWE (ft)
		SWL	GWE	SWL	GWE	SWL	GWE	SWL	GWE	
110	4450.57	66.31	4384.26	65.64	4384.93	66.45	4384.12	66.08	4384.49	0.81
111	4468.04	75.50	4392.54	75.07	4392.97	75.59	4392.45	74.89	4393.15	0.70
134	4478.93	84.25	4394.68	83.82	4395.11	84.38	4394.55	83.57	4395.36	0.81
139	4467.66	71.71	4395.95	71.42	4396.24	71.98	4395.68	71.02	4396.64	0.96
145	4478.26	86.34	4391.92	85.85	4392.41	86.34	4391.92	85.88	4392.38	0.49
146	4459.30	69.71	4389.59	69.26	4390.04	69.74	4389.56	69.21	4390.09	0.53
159	4491.79	96.28	4395.51	95.79	4396.00	96.46	4395.33	95.61	4396.18	0.85
502	4441.30	57.18	4384.12	56.44	4384.86	57.23	4384.07	56.86	4384.44	0.79
515	4450.35	57.27	4393.08	56.95	4393.40	57.42	4392.93	56.63	4393.72	0.79
517	4444.45	60.39	4384.06	59.72	4384.73	60.54	4383.91	60.18	4384.27	0.82
523	4452.98	56.86	4396.12	56.66	4396.32	57.17	4395.81	56.15	4396.83	1.02
524	4399.92	17.21	4382.71	16.71	4383.21	17.46	4382.46	17.14	4382.78	0.75
525	4399.61	16.85	4382.76	16.34	4383.27	17.10	4382.51	16.77	4382.84	0.76
TW-9S	4450.23	64.44	4385.79	64.22	4386.01	64.98	4385.25	64.60	4385.63	0.76
TW-11S	4426.24	42.44	4383.80	41.81	4384.43	42.64	4383.60	42.29	4383.95	0.83
TW-12S	4436.28	52.28	4384.00	51.62	4384.66	52.45	4383.83	52.07	4384.21	0.83

NOTES: Measuring Point Elevations are in feet above mean sea level.
SWL = static water level in feet below measuring point.
GWE = groundwater elevation in feet above mean sea level.

TABLE 4.
INTERIM CERCLA MONITORING WELLS
SUMMARY OF GROUNDWATER CONCENTRATIONS

Parameter	2009 Concentration Range				
	All Wells	On-Plant / Joint Fenceline Area Wells[(1)]	Plant Site Downgradient Wells[(2)]	Wells Downgradient of FMC and Simplot Plant Sites[(3)]	Northern Perimeter Wells[(4)]
pH	6.03 - 7.53	6.03 - 6.96	6.94 - 7.17	6.63 - 7.28	7.24 - 7.53
specific conductance	501 - 6089	2803 - 6089	1145 - 1484	661 - 1482	501 - 1480
sulfate	45 - 2960	238 - 2960	124 - 213	79.1 - 174	45 - 148
chloride	20.3 - 1040	165 - 1040	106 - 199	31.8 - 202	20.3 - 221
fluoride	<0.1 - 1.6	0.1 - 1.0	<0.1 - 0.5	0.2 - 1.6	0.5 - 1.0
nitrate as N	<0.1 - 34.2	<0.1 - 34.2	4.2 - 9.8	3.3 - 9.9	1.6 - 4.8
ammonia as N	0.1 - 5.5	0.1 - 5.5	<0.2	<0.2 - 0.4	<0.2 - 0.3
total P	0.027 - 219	0.1 - 219	0.896 - 2.9	0.584 - 11.3	0.027 - <0.1
potassium (total)	3.4 - 232	37.3 - 232	18.4 - 50.8	6.82 - 39.2	3.40 - 8.72
arsenic (total)	0.00086 - 0.483	0.010 - 0.483	0.0194 - 0.0402	0.0071 - 0.0281	0.00086 - 0.0065
selenium (total)	0.00049 - 0.0825	0.0058 - 0.0825	0.0031 - 0.0278	0.0044 - 0.0142	0.00049 - <0.005

NOTES: Concentrations in mg/L except pH (standard units) and specific conductance (µmhos/cm)
(1) Wells 134, 139, 145, 159
(2) Wells 110, 111, 146, TW-9S
(3) Wells 517, TW-12S
(4) Wells 502, 515, 523, 524, 525, TW-11S

TABLE 5.
INTERIM CERCLA MONITORING WELLS
2009 REPRESENTATIVE CONCENTRATION COMPARISON

Analyte	*Representative Concentrations*	*Groundwater Comparative Value*	**2009 Monitoring Results**[2]									
			502		515		524		525		TW-11S	
	M95 [1]		2Q09	4Q09	2Q09	4Q09	2Q09	4Q09	2Q09	4Q09	2Q09	4Q09
chloride	*192.9*	*250*	58	51	186	**221**	20.6	20.3	22.5	24.7	24.2	20.4
potassium	*12.72*		5.77	6.34	6.84	8.35	3.4	4.0	3.71	4.02	3.67	3.97
sulfate	*72.57*	*250*	68.4	**78.4**	**148**	**133**	45.4	45.3	48.8	48.9	52	45
SC	*1136*		638	851	**1184**	**1480**	501	591	516	616	639	566
pH		*6.5 - 8.5*	7.41	7.34	7.30	7.31	7.45	7.53	7.51	7.50	7.33	7.42
ammonia-N	*0.50*		0.3	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
nitrate-N	*5.52*	*10*	2.6	4.5	3.2	3.5	1.7	2.0	1.9	2.2	2.1	1.6
orthophosphate	*0.06*											
phosphorus	*0.33*		0.0439	0.04	0.0464	0.04	0.0272	0.03	0.0366	0.03	0.0319	<0.1
fluoride	*0.80*	*4*	**0.9**	0.8	0.8	**1.0**	0.7	0.8	0.7	0.8	0.7	0.8
arsenic	*0.0141*	*0.01*	0.0044	0.0043	0.0056	0.0051	0.00086	<0.005	0.0019	0.0036	0.0012	<0.005
manganese	*0.0518*	*0.05*										
selenium	*0.0057*	*0.05*	0.0008	<0.005	0.0011	<0.005	0.0008	<0.005	0.00049	<0.005	0.0012	<0.005

The sources of representative concentrations and comparative values are described in Table 4.2-1 of the GWCCR (FMC, 2009).
(1) M95 = Michaud representative concentration, 95th percentile values for pre-1994 data as presented in Table 4.4-1 in the EMF RI report with the exception of the representative arsenic concentration that is a 95% Upper Prediction Limit as described in Section 4.4 of the GWCCR (FMC, 2009).
(2) **Bold values** exceed representative concentration.

TABLE 6. MANN-KENDALL TREND TEST RESULTS

INTERIM CERCLA 2009 GROUNDWATER MONITORING REPORT

Site	n	Data Period	Statistic	Arsenic (Total)	Potassium	Orthophosphate / Total Phosphorus	Selenium (Total)	Sulfate
On-Plant Wells								
134	12	1998-2009	Trend	None	**Increasing**	None	None	**Increasing**
			Z-score	0.62	**2.34**	0.55	0.41	**3.57**
			p-value	0.54	**0.02**	0.58	0.68	**0.00**
139	12	2002-2009	Trend	None	None	None	**Increasing**	**Increasing**
			Z-score	1.10	-0.75	0.00	**2.54**	**2.34**
			p-value	0.27	0.45	1.00	**0.011**	**0.019**
145	10	1992-2009	Trend	None	**Decreasing**	None	**Decreasing**	**Increasing**
			Z-score	NA	**NA**	NA	**NA**	**NA**
			p-value	0.22	**0.017**	1.0	**0.028**	**0.0092**
159	12	1997-2009	Trend	**Increasing**	**Increasing**	**Increasing**	None	None
			Z-score	**3.22**	**3.36**	**2.26**	1.00	-0.14
			p-value	**0.001**	**0.001**	**0.02**	0.32	0.89
Plant Site Downgradient Wells								
110	16	2002-2009	Trend	**Decreasing**	**Decreasing**	**Decreasing**	**Decreasing**	**Decreasing**
			Z-score	**-4.82**	**-3.29**	**-3.43**	**-4.55**	**-4.19**
			p-value	**0.0000**	**0.0010**	**0.0006**	**0.0000**	**0.0000**
111	16	2002-2009	Trend	**Decreasing**	**Decreasing**	**Decreasing**	None	**Decreasing**
			Z-score	**-4.73**	**-4.83**	**-2.57**	-0.68	**-2.30**
			p-value	**0.0000**	**0.0000**	**0.0102**	0.50	**0.021**
146	16	2002-2009	Trend	**Increasing**	**Decreasing**	**Increasing**	**Decreasing**	**Increasing**
			Z-score	**2.93**	**-2.07**	**2.61**	**-2.55**	**3.38**
			p-value	**0.003**	**0.038**	**0.009**	**0.01**	**0.00**
TW-9S	12	1998-2009	Trend	None	**Decreasing**	None	None	None
			Z-score	-1.65	**-3.71**	-0.14	0.55	-0.82
			p-value	0.10	**0.0002**	0.89	0.58	0.41

NOTES:

Data period selected to provide sufficient samples (n) for meaningful statistical testing (see Section 5.2 for details).
Two-sided test for trend performed at 95% confidence level ($\alpha = 0.05$).
Critical Z-score = 1.96 (if $|Z| > 1.96$, then $p < 0.05$ and trend is significant).
NA = insufficient data for large-sample approximation. Exact test used, no Z-score calculated.

TABLE 6 (CONT.). MANN-KENDALL TREND TEST RESULTS
INTERIM CERCLA 2009 GROUNDWATER MONITORING REPORT

Site	n	Data Period	Statistic	Arsenic (Total)	Potassium	Orthophosphate / Total Phosphorus	Selenium (Total)	Sulfate
Wells Downgradient of FMC and Simplot Plant Sites								
517	10	1993-2009	Trend	None	None	None	None	None
			Z-score	NA	NA	NA	NA	NA
			p-value	0.86	0.73	0.86	0.61	0.11
TW-12S	12	1998-2009	Trend	**Decreasing**	**Decreasing**	None	**Decreasing**	**Decreasing**
			Z-score	**-2.75**	**-2.67**	-1.44	**-2.81**	**-2.13**
			p-value	**0.006**	**0.008**	0.15	**0.005**	**0.033**
Northern Perimeter Wells								
502	12	1998-2009	Trend	None	None	None	None	**Decreasing**
			Z-score	0.55	-1.44	-0.91	-1.16	**-2.54**
			p-value	0.58	0.15	0.36	0.25	**0.011**
515	16	2002-2009	Trend	None	None	None	None	None
			Z-score	-0.16	0.13	-0.58	-1.67	0.27
			p-value	0.87	0.90	0.56	0.09	0.79
523	12	1999-2009	Trend	None	None	None	None	None
			Z-score	-1.31	0.21	-1.79	-1.54	1.30
			p-value	0.19	0.83	0.07	0.12	0.19
524	16	2002-2009	Trend	**Decreasing**	None	None	None	None
			Z-score	**-2.15**	0.59	-1.58	-1.42	0.95
			p-value	**0.03**	0.56	0.11	0.16	0.34
525	16	2002-2009	Trend	None	None	None	None	None
			Z-score	0.28	0.72	0.57	-0.18	1.03
			p-value	0.78	0.47	0.57	0.86	0.30
TW-11S	12	1998-2009	Trend	None	**Decreasing**	None	None	**Decreasing**
			Z-score	-1.21	**-2.54**	-0.25	-1.16	**-2.67**
			p-value	0.23	**0.011**	0.80	0.25	**0.008**

NOTES:

Data period selected to provide sufficient samples (n) for meaningful statistical testing (see Section 5.2 for details).
Two-sided test for trend performed at 95% confidence level ($\alpha = 0.05$).
Critical Z-score = 1.96 (if $|Z| > 1.96$, then $p < 0.05$ and trend is significant).
NA = insufficient data for large-sample approximation. Exact test used, no Z-score calculated.

FIGURES

LEGEND

- FMC PLANT OU BOUNDARY
- FORT HALL INDIAN RESERVATION BOUNDARY
- UNION PACIFIC RAILROAD
- FORMER PLANT STRUCTURES
- RCRA UNIT - CLOSED IN PLACE
- FORMER POND OR STORAGE AREA
- CALCINER POND REMEDIAL ACTION AREA

AREA NORTH OF I-86
NORTHERN FMC PROPERTIES
FMC PLANT
SIMPLOT FACILITY
WESTERN PONDS AREA
CENTRAL PLANT AREA
JOINT FENCELINE AREA
SIMPLOT GYPSUM STACK
SLAG PILE
SLAG PIT
TANKS
PIT
BATISTE SPRING
SWANSON ROAD SPRING
I-86
DRAG STRIP
CULVERT
Portneuf River
U.S.30
RAILROAD SWALE
FURNACE BUILDING
FORMER KILN SCRUBBER OVERFLOW POND
IWW BASIN
HAW DITCH
SUBSTATION
FORMER KILN SCRUBBER PONDS
BANNOCK PAVING AREA
18 CELL B CLOSED BY REMOVAL
18 CELL A
FORMER CALCINER POND SEDIMENT STORAGE AREA
LANDFILL
KINPORT SUBSTATION SITE
MAG N 17°
NORTH

SCALE (In Feet) 0 1000

FMC CORPORATION–POCATELLO, IDAHO
INTERIM CERCLA GROUNDWATER MONITORING REPORT

FMC PLANT OPERABLE UNIT SITE MAP

FIGURE 1

UPDATE TIME: 1:29PM
LT \HEL\020211\I:\Land Projects\1303b201\dwg\1303b201h136.dwg

Hydrometrics, Inc.
Consulting Scientists and Engineers

LEGEND

- RCRA PROGRAM WELLS
- CERCLA PROGRAM WELLS
- CALCINER POND PROGRAM WELLS

AREA NORTH OF I-86
NORTHERN FMC PROPERTIES
WESTERN PONDS AREA
CENTRAL PLANT AREA
FMC PLANT
SLAG PILE
SLAG PILE
JOINT FENCELINE AREA
SIMPLOT GYPSUM STACK
SIMPLOT FACILITY
TANKS
TANKS
TANKS
TANKS
PIT
BATISTE SPRING
SWANSON ROAD SPRING
CULVERT
DRAG STRIP
RAILROAD SWALE
FURNACE BUILDING
SLAG PIT
SUBSTATION
BANNOCK PAVING AREA
18 CELL B CLOSED BY REMOVAL
18 CELL A
LANDFILL
IDAHO POWER KINPORT SUBSTATION SITE
Portneuf River
I-86
U.S. 30
TW-9S
TW-12S
TW-11S
TW-11I
TW-8S
TW-7S
TW-10S
TW-5S
TW-5I
TW-5D
TW-2S
TW-2I
TW-2D
TW-4S
TW-4I
TW-4D
FMC-1
FMC-2
FMC-3
FMC-4
FMC-5
FMC-6
FMC-7
TW-3D
TW-3S
B-3
OPH
NPH

SCALE
0 (In Feet) 1000

NORTH

FMC CORPORATION–POCATELLO, IDAHO
INTERIM CERCLA 2009 GROUNDWATER MONITORING REPORT

FMC PLANT OU MONITORING WELL LOCATIONS

FIGURE 2

UPDATE TIME: 3:35PM
SDP\HEL\070210\I:\Land Projects\1303b201\dwg\1303b201h131.dwg

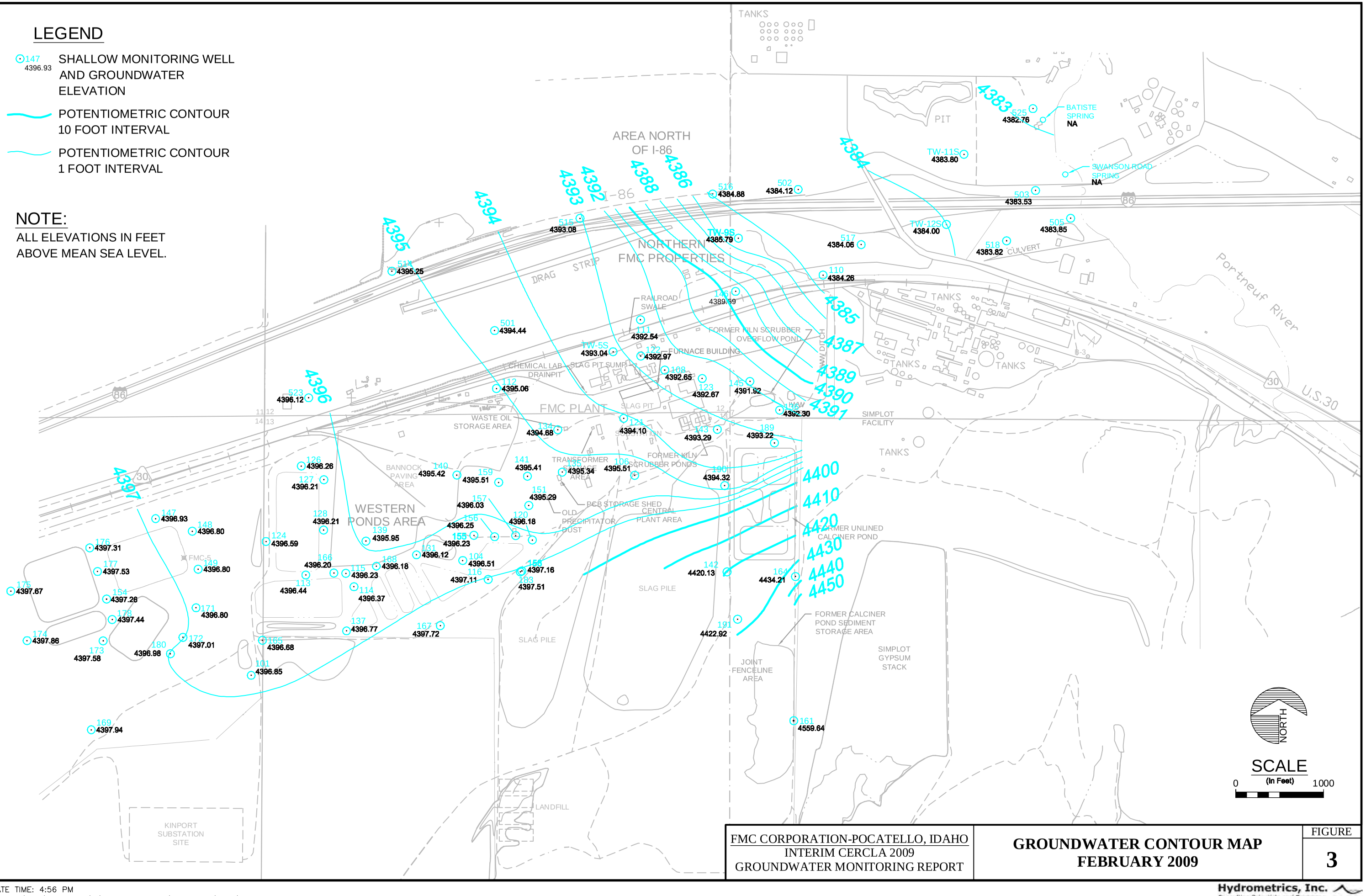
Hydrometrics, Inc.
Consulting Scientists and Engineers

LEGEND

- 147 / 4396.93 — SHALLOW MONITORING WELL AND GROUNDWATER ELEVATION
- POTENTIOMETRIC CONTOUR 10 FOOT INTERVAL
- POTENTIOMETRIC CONTOUR 1 FOOT INTERVAL

NOTE:

ALL ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL.



FMC CORPORATION-POCATELLO, IDAHO
INTERIM CERCLA 2009
GROUNDWATER MONITORING REPORT

GROUNDWATER CONTOUR MAP
FEBRUARY 2009

FIGURE
3

UPDATE TIME: 4:56 PM
LTABORSKY\HEL\20101214\I:\LAND PROJECTS\1303B201\DWG\1303B201H118.DWG

Hydrometrics, Inc.
Consulting Scientists and Engineers

LEGEND

- 147 / 4397.16 — SHALLOW MONITORING WELL AND GROUNDWATER ELEVATION
- POTENTIOMETRIC CONTOUR 10 FOOT INTERVAL
- POTENTIOMETRIC CONTOUR 1 FOOT INTERVAL

NOTE:

ALL ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL.

AREA NORTH OF I-86
NORTHERN FMC PROPERTIES
EFMC PLANT
WESTERN PONDS AREA
SLAG PILE
SLAG PILE
LANDFILL
KINPORT SUBSTATION SITE
PIT
TANKS
TANKS
TANKS
TANKS
TANKS
DRAG STRIP
RAILROAD SWALE
FORMER KILN SCRUBBER OVERFLOW POND
FURNACE BUILDING
CHEMICAL LAB DRAINPIT
SLAG PIT SUMP
SLAG PIT
WASTE OIL STORAGE AREA
BANNOCK PAVING AREA
TRANSFORMER AREA
FORMER KILN SCRUBBER PONDS
PCB STORAGE SHED
OLD PRECIPITATOR DUST
CENTRAL PLANT AREA
FORMER UNLINED CALCINER POND
FORMER CALCINER POND SEDIMENT STORAGE AREA
SIMPLOT GYPSUM STACK
SIMPLOT FACILITY
JOINT FENCELINE AREA
BATISTE SPRING NA
SWANSON ROAD SPRING NA
CULVERT
Portneuf River
U.S. 30
I-86

501 4394.74	502 4384.86
503 4384.21	505 4384.55
510 4384.93	514 4395.47
515 4393.40	516 4385.51
517 4384.73	518 4384.50
523 4396.32	525 4383.27
TW-5S 4393.46	TW-9S 4386.01
TW-11S 4384.43	TW-12S 4384.66
101 4397.11	102 4395.23
104 4396.83	105 4397.82
106 4395.91	108 4393.05
111 4392.97	112 4393.39
114 4396.66	115 4396.54
116 4396.39	120 4396.54
121 4396.43	121 4394.51
123 4393.14	124 4396.86
126 4396.55	127 4396.49
128 4396.50	134 4395.11
137 4397.05	139 4396.24
140 4395.85	141 4395.78
142 4420.44	143 4393.78
145 4392.41	146 4390.04
147 4397.16	148 4397.03
151 4395.66	154 4397.47
155 4396.56	156 4396.58
157 4396.35	158 4397.46
159 4396.00	161 4559.76
164 4434.43	165 4396.96
166 4396.49	167 4397.95
168 4396.49	169 4398.20
171 4397.07	172 4397.19
173 4397.82	174 4398.10
175 4397.95	176 4397.55
177 4397.79	179 4397.74
180 4397.32	189 4393.77
190 4394.81	191 4423.08
4392.82	

4384.5 4384 4386 4388 4390 4392 4393 4394 4395 4396 4397 4398 4400 4410 4420 4430 4440 4385 4387 4389 4391

NORTH

SCALE (In Feet) 0 1000

FMC CORPORATION-POCATELLO, IDAHO
INTERIM CERCLA 2009
GROUNDWATER MONITORING REPORT

GROUNDWATER CONTOUR MAP MAY 2009

FIGURE 4

UPDATE TIME: 4:57 PM
LTABORSKY\HEL\20101214\I:\LAND PROJECTS\1303B201\DWG\1303B201H119.DWG

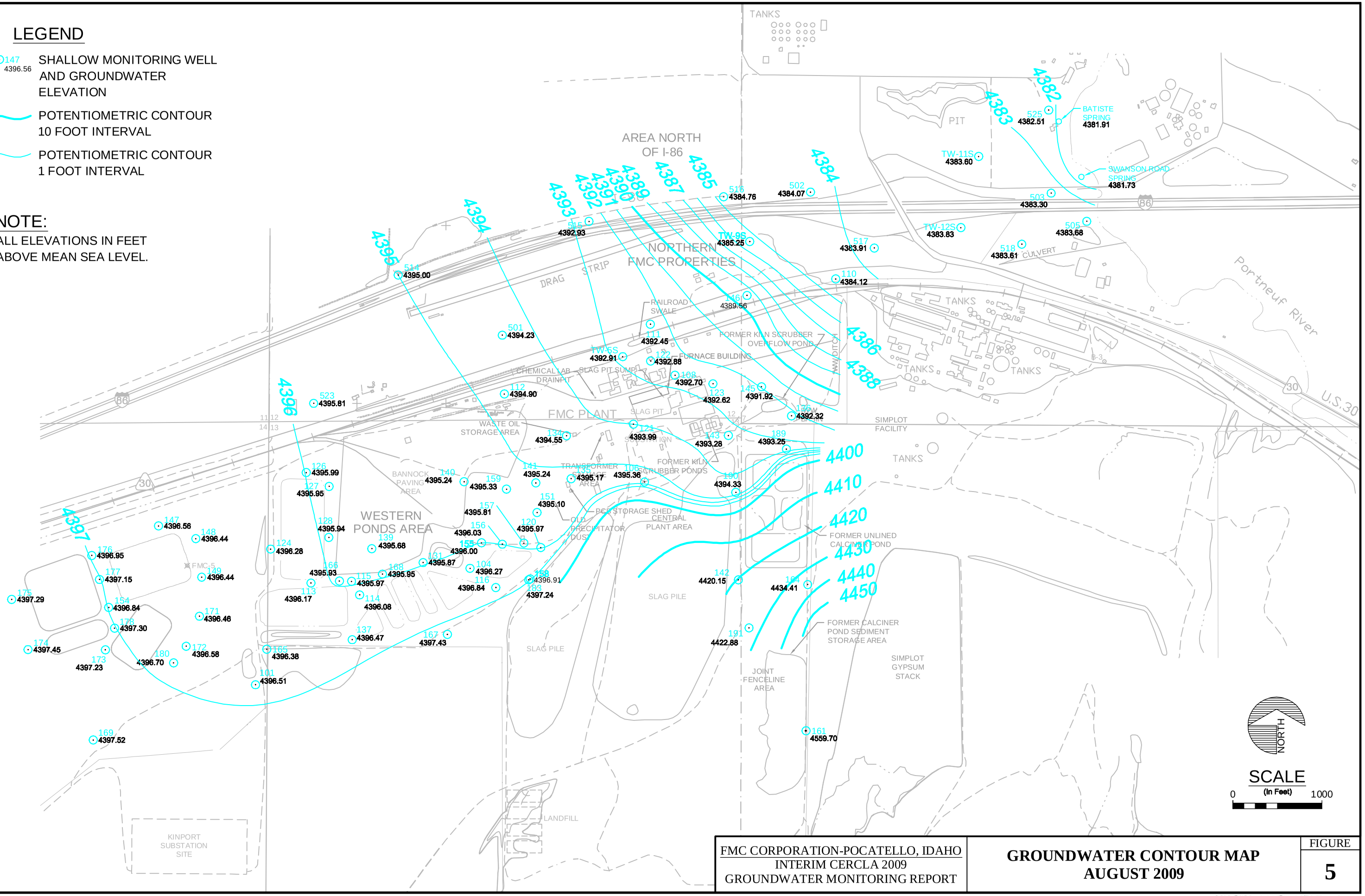
Hydrometrics, Inc.
Consulting Scientists and Engineers

LEGEND

- 147 / 4396.56 — SHALLOW MONITORING WELL AND GROUNDWATER ELEVATION
- POTENTIOMETRIC CONTOUR 10 FOOT INTERVAL
- POTENTIOMETRIC CONTOUR 1 FOOT INTERVAL

NOTE:

ALL ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL.



FMC CORPORATION-POCATELLO, IDAHO
INTERIM CERCLA 2009
GROUNDWATER MONITORING REPORT

GROUNDWATER CONTOUR MAP
AUGUST 2009

FIGURE
5

UPDATE TIME: 4:59 PM
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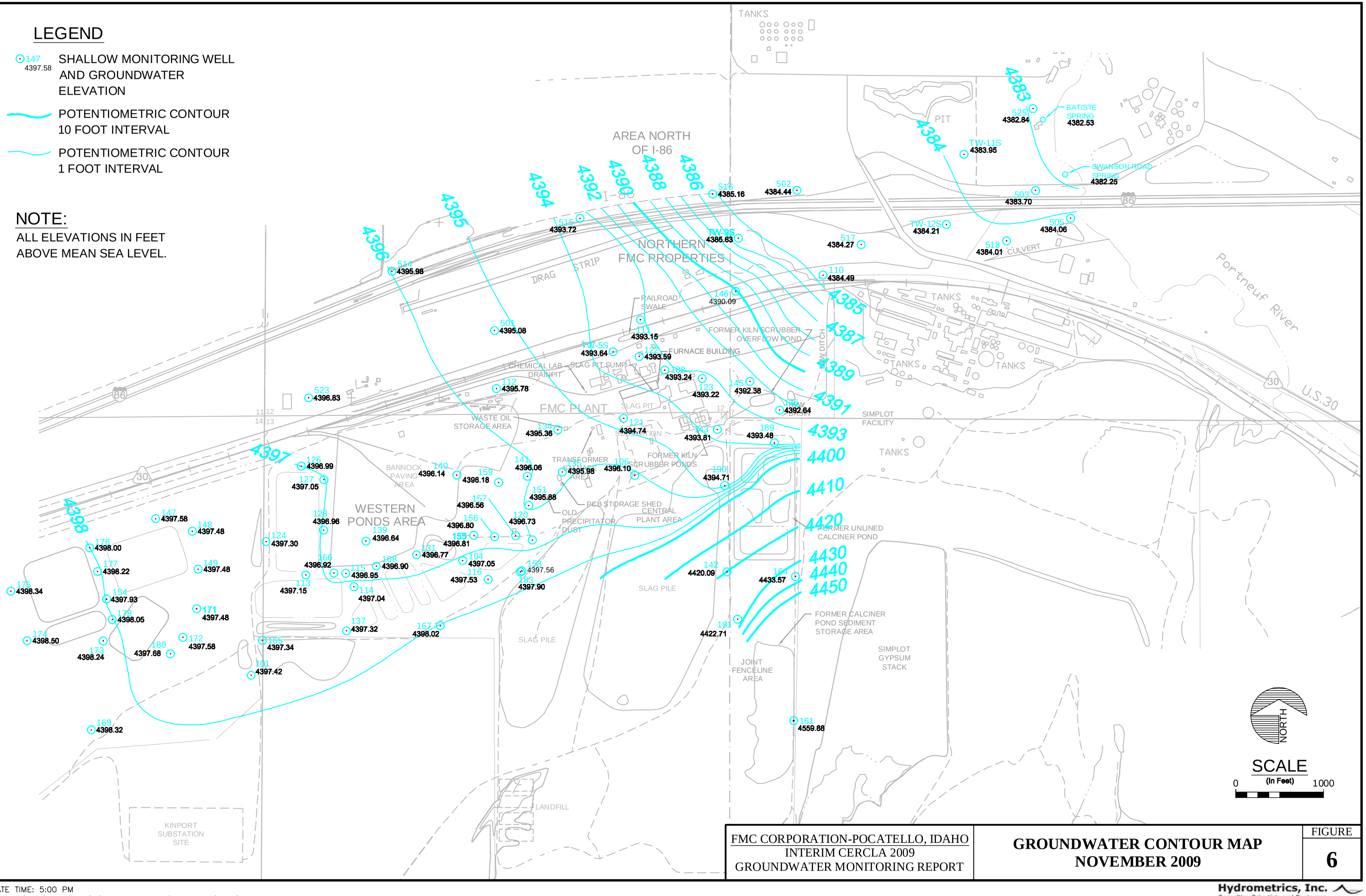
Hydrometrics, Inc.
Consulting Scientists and Engineers

LEGEND

- 147 / 4397.58 — SHALLOW MONITORING WELL AND GROUNDWATER ELEVATION
- POTENTIOMETRIC CONTOUR 10 FOOT INTERVAL
- POTENTIOMETRIC CONTOUR 1 FOOT INTERVAL

NOTE:

ALL ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL.



FMC CORPORATION-POCATELLO, IDAHO INTERIM CERCLA 2009 GROUNDWATER MONITORING REPORT	**GROUNDWATER CONTOUR MAP NOVEMBER 2009**	FIGURE **6**

UPDATE TIME: 5:00 PM
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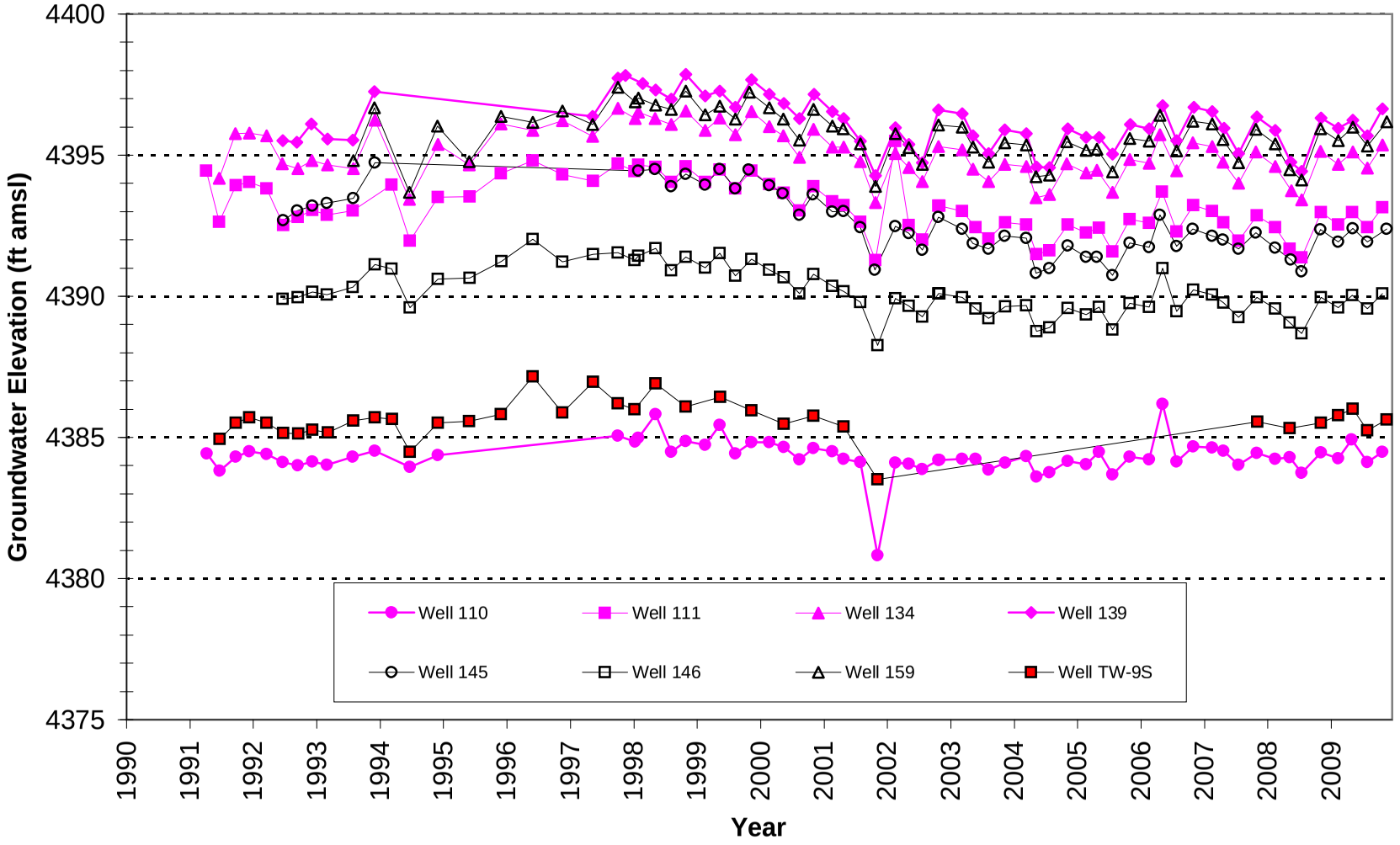
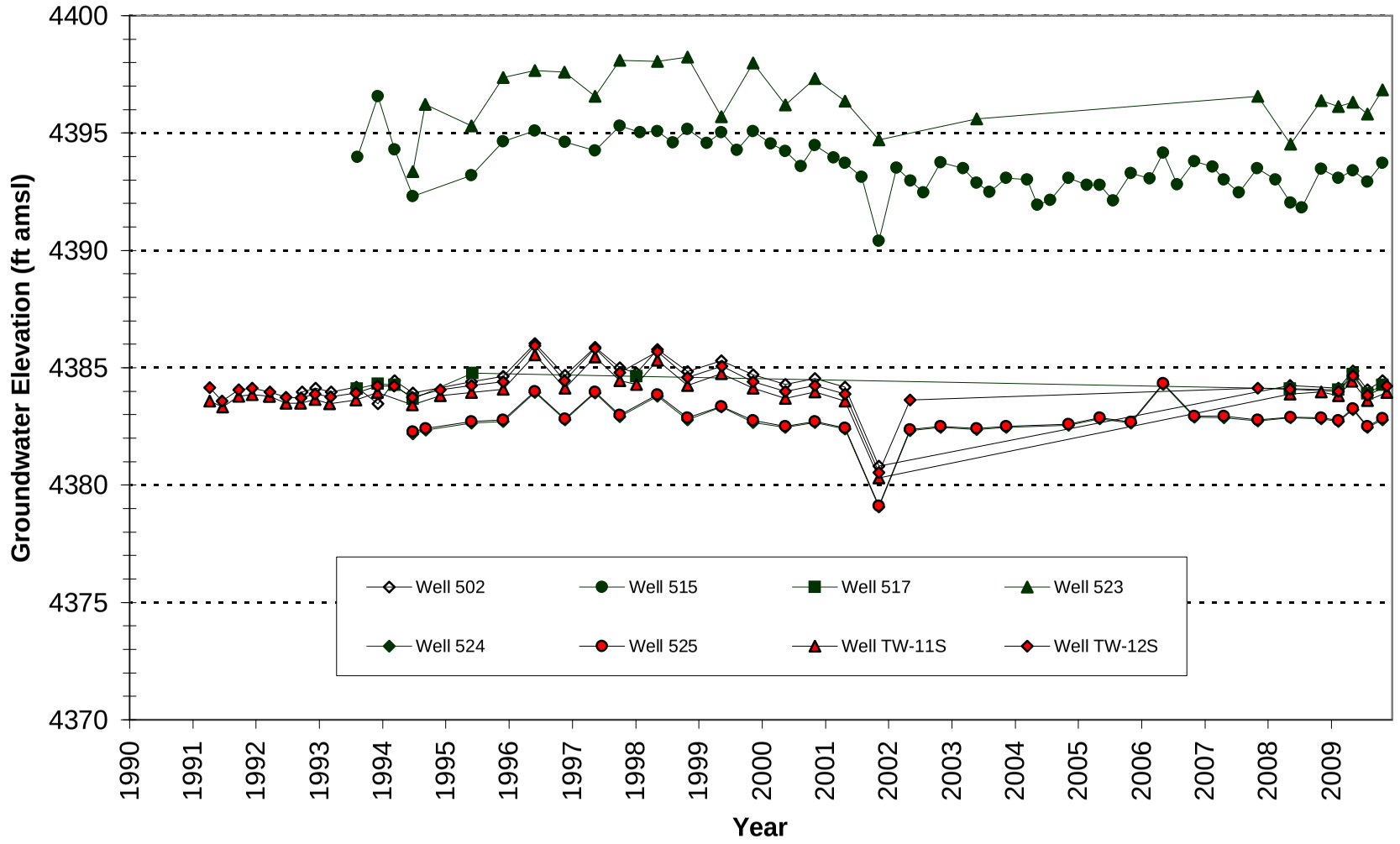
Hydrometrics, Inc.
Consulting Scientists and Engineers



Hydrometrics, Inc. Consulting Scientists and Engineers	INTERIM CERCLA 2009 GROUNDWATER MONITORING REPORT FMC PLANT OPERABLE UNIT	**INTERIM CERCLA MONITORING WELL GROUNDWATER HYDROGRAPH ON PLANT AND PLANT SITE DOWNGRADIENT WELLS**	**FIGURE** **7**



Hydrometrics, Inc. Consulting Scientists and Engineers	INTERIM CERCLA 2009 GROUNDWATER MONITORING REPORT FMC PLANT OPERABLE UNIT	**INTERIM CERCLA MONITORING WELL GROUNDWATER HYDROGRAPH FMC/SIMPLOT DOWNGRADIENT AND NORTHERN PERIMETER WELLS**	**FIGURE** **8**

APPENDIX A

2009 GROUNDWATER QUALITY TABLES

2009 Groundwater Quality

STATION ID: 110		
CONSTITUENT	Conc. Qual Qtr-2-2009	Conc. Qual Qtr-4-2009
DEPTH TO WATER LEVEL (FEET)	65.64	66.08
OXIDATION REDUCTION POTENTIAL		86.2
EH (MILLIVOLTS)		294.39
OXYGEN (O) (FLD) DIS	1.81	1.84
PH (FLD)	6.95	6.96
SC (UMHOS/CM AT 25C) (FLD)	1370	1411
TURBIDITY (NTU) (FLD)	0.5	0.2
WATER TEMPERATURE (C) (FLD)	16.9	17
POTASSIUM (K) TOT	18.4 J	25.3 J
SULFATE (SO4)	208	213
CHLORIDE (CL)	106 J	107
FLUORIDE (F)	0.4	0.5
TOTAL AMMONIA (NH3+NH4 AS N)	< 0.2	< 0.2
NITRATE (NO3-N)	4.2	4.5
PHOSPHORUS (6020) TOT	1.36	
PHOSPHORUS (P) TOT		1.6
ARSENIC (AS) TOT	0.0369	0.0402
SELENIUM (SE) TOT	0.0251	0.0278

STATION ID: 111		
CONSTITUENT	Conc. Qual Qtr-2-2009	Conc. Qual Qtr-4-2009
DEPTH TO WATER LEVEL (FEET)	75.07	74.89
OXIDATION REDUCTION POTENTIAL		218.6
EH (MILLIVOLTS)		428.69
OXYGEN (O) (FLD) DIS	0.53	0.49
PH (FLD)	7.04	7.09
SC (UMHOS/CM AT 25C) (FLD)	1300	1426
TURBIDITY (NTU) (FLD)	0.5	0.1
WATER TEMPERATURE (C) (FLD)	15.1	15.4
POTASSIUM (K) TOT	30.1 J	39.8 J
SULFATE (SO4)	183	170
CHLORIDE (CL)	189 J	176
FLUORIDE (F)	< 0.1	0.2
TOTAL AMMONIA (NH3+NH4 AS N)	< 0.2	< 0.2
NITRATE (NO3-N)	9	8.2
PHOSPHORUS (6020) TOT	2.44	
PHOSPHORUS (P) TOT		2.9
ARSENIC (AS) TOT	0.0194	0.0224
SELENIUM (SE) TOT	0.0057	0.0078

All results are in mg/l unless otherwise noted.

Qualifiers:
< - Measured Not Detected
U - Qualified Not Detected
J - Estimated

2009 Groundwater Quality

STATION ID: 134		
CONSTITUENT	Conc. Qual Qtr-2-2009	Conc. Qual Qtr-4-2009
DEPTH TO WATER LEVEL (FEET)	83.82	83.57
OXIDATION REDUCTION POTENTIAL	150.5	236.5
EH (MILLIVOLTS)	359	444.92
OXYGEN (O) (FLD) DIS	0.11	0.2
PH (FLD)	6.75	6.75
SC (UMHOS/CM AT 25C) (FLD)	2803	3268
TURBIDITY (NTU) (FLD)	0.7	0.7
WATER TEMPERATURE (C) (FLD)	16.9	16.8
POTASSIUM (K) TOT	232 J	194 J
SULFATE (SO4)	376	366
CHLORIDE (CL)	394	389
FLUORIDE (F)	0.1	0.2
TOTAL AMMONIA (NH3+NH4 AS N)	1 U	0.4 U
NITRATE (NO3-N)	22.1	24.5
PHOSPHORUS (6020) TOT	29.9 J	
PHOSPHORUS (P) TOT		19
ARSENIC (AS) TOT	0.144	0.0866
SELENIUM (SE) TOT	0.009 J	0.0078

STATION ID: 139		
CONSTITUENT	Conc. Qual Qtr-2-2009	Conc. Qual Qtr-4-2009
DEPTH TO WATER LEVEL (FEET)	71.42	71.02
OXIDATION REDUCTION POTENTIAL	264.6	318.8
EH (MILLIVOLTS)	478	532.1
OXYGEN (O) (FLD) DIS	1.3	2.1
PH (FLD)	6.96	6.94
SC (UMHOS/CM AT 25C) (FLD)	4647	5608
TURBIDITY (NTU) (FLD)	0.7	0.6
WATER TEMPERATURE (C) (FLD)	13	12.7
POTASSIUM (K) TOT	37.3 J	38.2 J
SULFATE (SO4)	1030	1220
CHLORIDE (CL)	911	1040
FLUORIDE (F)	0.7	1
TOTAL AMMONIA (NH3+NH4 AS N)	0.1 U	< 0.2
NITRATE (NO3-N)	34.2	32.8
PHOSPHORUS (6020) TOT	0.202 U J	
PHOSPHORUS (P) TOT		0.1
ARSENIC (AS) TOT	0.0122 J	0.01
SELENIUM (SE) TOT	0.0503 J	0.0418

All results are in mg/l unless otherwise noted.

Qualifiers:
< - Measured Not Detected
U - Qualified Not Detected
J - Estimated

2009 Groundwater Quality

STATION ID: 145		
CONSTITUENT	Conc. Qual Qtr-2-2009	Conc. Qual Qtr-4-2009
DEPTH TO WATER LEVEL (FEET)	85.85	85.88
OXIDATION REDUCTION POTENTIAL	98.6	81.1
EH (MILLIVOLTS)	309	291.19
OXYGEN (O) (FLD) DIS	0.07	0.22
PH (FLD)	6.03	6.08
SC (UMHOS/CM AT 25C) (FLD)	5610	6089
TURBIDITY (NTU) (FLD)	3.6	3.5
WATER TEMPERATURE (C) (FLD)	15.5	15.4
POTASSIUM (K) TOT	64.6 J	64.3 J
SULFATE (SO4)	2960	2820
CHLORIDE (CL)	175	165
FLUORIDE (F)	0.4	0.3 U
TOTAL AMMONIA (NH3+NH4 AS N)	3.9	4
NITRATE (NO3-N)	3.4	3
PHOSPHORUS (6020) TOT	87.1 J	
PHOSPHORUS (P) TOT		82
ARSENIC (AS) TOT	0.483	0.305
SELENIUM (SE) TOT	0.0825	0.0566

STATION ID: 146		
CONSTITUENT	Conc. Qual Qtr-2-2009	Conc. Qual Qtr-4-2009
DEPTH TO WATER LEVEL (FEET)	69.26	69.21
OXIDATION REDUCTION POTENTIAL		128.9
EH (MILLIVOLTS)		337.09
OXYGEN (O) (FLD) DIS	2.97	3.06
PH (FLD)	7.07	7.13
SC (UMHOS/CM AT 25C) (FLD)	1145	1264
TURBIDITY (NTU) (FLD)	0.5	0.2
WATER TEMPERATURE (C) (FLD)	16.9	17
POTASSIUM (K) TOT	33.4 J	39 J
SULFATE (SO4)	147	124
CHLORIDE (CL)	155 J	134
FLUORIDE (F)	0.3	0.5
TOTAL AMMONIA (NH3+NH4 AS N)	< 0.2	< 0.2
NITRATE (NO3-N)	6.5	5.9
PHOSPHORUS (6020) TOT	0.896	
PHOSPHORUS (P) TOT		0.9
ARSENIC (AS) TOT	0.0254	0.0254
SELENIUM (SE) TOT	0.0031 U J	< 0.005

All results are in mg/l unless otherwise noted.

Qualifiers:
< - Measured Not Detected
U - Qualified Not Detected
J - Estimated

2009 Groundwater Quality

STATION ID: 159		
CONSTITUENT	Conc. Qual Qtr-2-2009	Conc. Qual Qtr-4-2009
DEPTH TO WATER LEVEL (FEET)	95.79	95.61
OXIDATION REDUCTION POTENTIAL	-87.5	-70
EH (MILLIVOLTS)	120	138.42
OXYGEN (O) (FLD) DIS	0.14	0.18
PH (FLD)	6.67	6.7
SC (UMHOS/CM AT 25C) (FLD)	3384	3654
TURBIDITY (NTU) (FLD)	1.4	1.3
WATER TEMPERATURE (C) (FLD)	17.2	16.8
POTASSIUM (K) TOT	128 J	134 J
SULFATE (SO4)	238	274
CHLORIDE (CL)	247	316
FLUORIDE (F)	< 0.1	< 0.1
TOTAL AMMONIA (NH3+NH4 AS N)	5.5	5.1
NITRATE (NO3-N)	< 0.1	< 0.1
PHOSPHORUS (6020) TOT	219 J	
PHOSPHORUS (P) TOT		72
ARSENIC (AS) TOT	0.162 J	0.114
SELENIUM (SE) TOT	< 0.05 J	0.0058 U J

STATION ID: 502		
CONSTITUENT	Conc. Qual Qtr-2-2009	Conc. Qual Qtr-4-2009
DEPTH TO WATER LEVEL (FEET)	56.44	56.86
OXIDATION REDUCTION POTENTIAL	79.8	123.2
EH (MILLIVOLTS)	293	336.61
OXYGEN (O) (FLD) DIS	7.21	7.09
PH (FLD)	7.41	7.34
SC (UMHOS/CM AT 25C) (FLD)	638	851
TURBIDITY (NTU) (FLD)	0.5	0.2
WATER TEMPERATURE (C) (FLD)	12.5	12.6
POTASSIUM (K) TOT	5.77 J	6.34 J
SULFATE (SO4)	68.4	78.4
CHLORIDE (CL)	48	51
FLUORIDE (F)	0.9	0.8
TOTAL AMMONIA (NH3+NH4 AS N)	0.3 U	< 0.2
NITRATE (NO3-N)	2.6	4.5
PHOSPHORUS (6020) TOT	0.0439 U J	
PHOSPHORUS (P) TOT		0.04 J
ARSENIC (AS) TOT	0.0044 J	0.0043 J
SELENIUM (SE) TOT	0.0008 J	< 0.005

All results are in mg/l unless otherwise noted.

Qualifiers:
< - Measured Not Detected
U - Qualified Not Detected
J - Estimated

2009 Groundwater Quality

STATION ID: 515		
CONSTITUENT	Conc. Qual Qtr-2-2009	Conc. Qual Qtr-4-2009
DEPTH TO WATER LEVEL (FEET)	56.95	56.63
OXIDATION REDUCTION POTENTIAL	50.1	124.5
EH (MILLIVOLTS)	262	336.73
OXYGEN (O) (FLD) DIS	3.95	4.21
PH (FLD)	7.3	7.31
SC (UMHOS/CM AT 25C) (FLD)	1184	1480
TURBIDITY (NTU) (FLD)	0.8	0.2
WATER TEMPERATURE (C) (FLD)	13.6	13.6
POTASSIUM (K) TOT	6.84 J	8.35 J
SULFATE (SO4)	148	133
CHLORIDE (CL)	186	221
FLUORIDE (F)	0.8	1
TOTAL AMMONIA (NH3+NH4 AS N)	0.3 U	< 0.2
NITRATE (NO3-N)	3.2	3.5
PHOSPHORUS (6020) TOT	0.0464 U J	
PHOSPHORUS (P) TOT		0.04 J
ARSENIC (AS) TOT	0.0056 J	0.0051
SELENIUM (SE) TOT	0.0011 J	< 0.005

STATION ID: 517		
CONSTITUENT	Conc. Qual Qtr-2-2009	Conc. Qual Qtr-4-2009
DEPTH TO WATER LEVEL (FEET)	59.72	60.18
OXIDATION REDUCTION POTENTIAL		166.2
EH (MILLIVOLTS)		378.19
OXYGEN (O) (FLD) DIS	3.74	4.7
PH (FLD)	7.13	7.28
SC (UMHOS/CM AT 25C) (FLD)	1482	1234
TURBIDITY (NTU) (FLD)	0.4	0.1
WATER TEMPERATURE (C) (FLD)	14.5	13.8
POTASSIUM (K) TOT	37.9 J	39.2 J
SULFATE (SO4)	168	124
CHLORIDE (CL)	202 J	144
FLUORIDE (F)	0.2	0.3
TOTAL AMMONIA (NH3+NH4 AS N)	< 0.2	< 0.2
NITRATE (NO3-N)	9.9	5.9
PHOSPHORUS (6020) TOT	0.584	
PHOSPHORUS (P) TOT		0.7
ARSENIC (AS) TOT	0.0257	0.0281
SELENIUM (SE) TOT	0.0142	0.0044

All results are in mg/l unless otherwise noted.

Qualifiers:
< - Measured Not Detected
U - Qualified Not Detected
J - Estimated

2009 Groundwater Quality

STATION ID: 523		
CONSTITUENT	Conc. Qual Qtr-2-2009	Conc. Qual Qtr-4-2009
DEPTH TO WATER LEVEL (FEET)	56.66	56.15
OXIDATION REDUCTION POTENTIAL		201.3
EH (MILLIVOLTS)		413.41
OXYGEN (O) (FLD) DIS	3.58	3.47
PH (FLD)	7.24	7.26
SC (UMHOS/CM AT 25C) (FLD)	879	993
TURBIDITY (NTU) (FLD)	0.4	0.2
WATER TEMPERATURE (C) (FLD)	13.7	13.7
POTASSIUM (K) TOT	6.69 J	8.72 J
SULFATE (SO4)	62.3	61.6
CHLORIDE (CL)	124 J	116
FLUORIDE (F)	0.5	0.5
TOTAL AMMONIA (NH3+NH4 AS N)	< 0.2	< 0.2
NITRATE (NO3-N)	4.8	4.6
PHOSPHORUS (6020) TOT	0.0265 U J	
PHOSPHORUS (P) TOT		0.03 J
ARSENIC (AS) TOT	0.0019 U J	0.0065
SELENIUM (SE) TOT	0.0023 U J	< 0.005

STATION ID: 524		
CONSTITUENT	Conc. Qual Qtr-2-2009	Conc. Qual Qtr-4-2009
DEPTH TO WATER LEVEL (FEET)	16.71	17.14
OXIDATION REDUCTION POTENTIAL	91.5	134.5
EH (MILLIVOLTS)	305	347.91
OXYGEN (O) (FLD) DIS	6.51	6.09
PH (FLD)	7.45	7.53
SC (UMHOS/CM AT 25C) (FLD)	501	591
TURBIDITY (NTU) (FLD)	0.4	0.2
WATER TEMPERATURE (C) (FLD)	12.8	12.6
POTASSIUM (K) TOT	3.4 J	4 J
SULFATE (SO4)	45.4	45.3
CHLORIDE (CL)	20.6 J	20.3
FLUORIDE (F)	0.7	0.8
TOTAL AMMONIA (NH3+NH4 AS N)	< 0.2	< 0.2
NITRATE (NO3-N)	1.7	2
PHOSPHORUS (6020) TOT	0.0272 U J	
PHOSPHORUS (P) TOT		0.03 J
ARSENIC (AS) TOT	0.00086 U J	< 0.005
SELENIUM (SE) TOT	0.0008 U J	< 0.005

All results are in mg/l unless otherwise noted.

Qualifiers:
< - Measured Not Detected
U - Qualified Not Detected
J - Estimated

2009 Groundwater Quality

STATION ID: 525		
CONSTITUENT	Conc. Qual Qtr-2-2009	Conc. Qual Qtr-4-2009
DEPTH TO WATER LEVEL (FEET)	16.34	16.77
OXIDATION REDUCTION POTENTIAL	82.5	136.2
EH (MILLIVOLTS)	297	349.61
OXYGEN (O) (FLD) DIS	7.06	6.41
PH (FLD)	7.51	7.5
SC (UMHOS/CM AT 25C) (FLD)	516	616
TURBIDITY (NTU) (FLD)	0.4	0.2
WATER TEMPERATURE (C) (FLD)	12.1	12.6
POTASSIUM (K) TOT	3.71 J	4.02 J
SULFATE (SO4)	48.8	48.9
CHLORIDE (CL)	22.5 J	24.7
FLUORIDE (F)	0.7	0.8
TOTAL AMMONIA (NH3+NH4 AS N)	< 0.2	< 0.2
NITRATE (NO3-N)	1.9	2.2
PHOSPHORUS (6020) TOT	0.0366	
PHOSPHORUS (P) TOT		0.03 J
ARSENIC (AS) TOT	0.0019 U J	0.0036 J
SELENIUM (SE) TOT	0.00049 U J	< 0.005

STATION ID: TW-9S		
CONSTITUENT	Conc. Qual Qtr-2-2009	Conc. Qual Qtr-4-2009
DEPTH TO WATER LEVEL (FEET)	64.22	64.6
OXIDATION REDUCTION POTENTIAL		-20.8
EH (MILLIVOLTS)		190.83
OXYGEN (O) (FLD) DIS	0.19	0.1
PH (FLD)	6.94	7.17
SC (UMHOS/CM AT 25C) (FLD)	1401	1484
TURBIDITY (NTU) (FLD)	5.9	6.4
WATER TEMPERATURE (C) (FLD)	14.2	14.1
POTASSIUM (K) TOT	40.2 J	50.8 J
SULFATE (SO4)	194	178
CHLORIDE (CL)	185 J	199
FLUORIDE (F)	< 0.1	< 0.1
TOTAL AMMONIA (NH3+NH4 AS N)	< 0.2	< 0.2
NITRATE (NO3-N)	9.8	9.7
PHOSPHORUS (6020) TOT	1.6	
PHOSPHORUS (P) TOT		2
ARSENIC (AS) TOT	0.0239	0.0237
SELENIUM (SE) TOT	0.0057	0.0079 U J

All results are in mg/l unless otherwise noted.

Qualifiers:
< - Measured Not Detected
U - Qualified Not Detected
J - Estimated

2009 Groundwater Quality

STATION ID: TW-11S		
CONSTITUENT	Conc. Qual Qtr-2-2009	Conc. Qual Qtr-4-2009
DEPTH TO WATER LEVEL (FEET)	41.81	42.29
OXIDATION REDUCTION POTENTIAL		36.5
EH (MILLIVOLTS)		250.51
OXYGEN (O) (FLD) DIS	6.46	8.04
PH (FLD)	7.33	7.42
SC (UMHOS/CM AT 25C) (FLD)	639	566
TURBIDITY (NTU) (FLD)	6.1	2.1
WATER TEMPERATURE (C) (FLD)	12.3	12.1
POTASSIUM (K) TOT	3.67	3.97 J
SULFATE (SO4)	52	45
CHLORIDE (CL)	24.2 J	20.4
FLUORIDE (F)	0.7	0.8
TOTAL AMMONIA (NH3+NH4 AS N)	< 0.2	< 0.2
NITRATE (NO3-N)	2.1	1.6
PHOSPHORUS (6020) TOT	0.0319	< 0.1
PHOSPHORUS (P) TOT		
ARSENIC (AS) TOT	0.0012	< 0.005
SELENIUM (SE) TOT	0.0012	< 0.005

STATION ID: TW-12S		
CONSTITUENT	Conc. Qual Qtr-2-2009	Conc. Qual Qtr-4-2009
DEPTH TO WATER LEVEL (FEET)	51.62	52.07
OXIDATION REDUCTION POTENTIAL	27.1	30.3
EH (MILLIVOLTS)	238	242.53
OXYGEN (O) (FLD) DIS	0.24	3.17
PH (FLD)	6.63	6.92
SC (UMHOS/CM AT 25C) (FLD)	890	661
TURBIDITY (NTU) (FLD)	7.6	2.1
WATER TEMPERATURE (C) (FLD)	14.5	13.6
POTASSIUM (K) TOT	9.6 J	6.82 J
SULFATE (SO4)	174	79.1
CHLORIDE (CL)	49.7 J	31.8
FLUORIDE (F)	1.4	1.6
TOTAL AMMONIA (NH3+NH4 AS N)	0.4	0.2 U
NITRATE (NO3-N)	7.7	3.3
PHOSPHORUS (6020) TOT	11.3	
PHOSPHORUS (P) TOT		4
ARSENIC (AS) TOT	0.0155	0.0071
SELENIUM (SE) TOT	0.0052	< 0.005

All results are in mg/l unless otherwise noted.

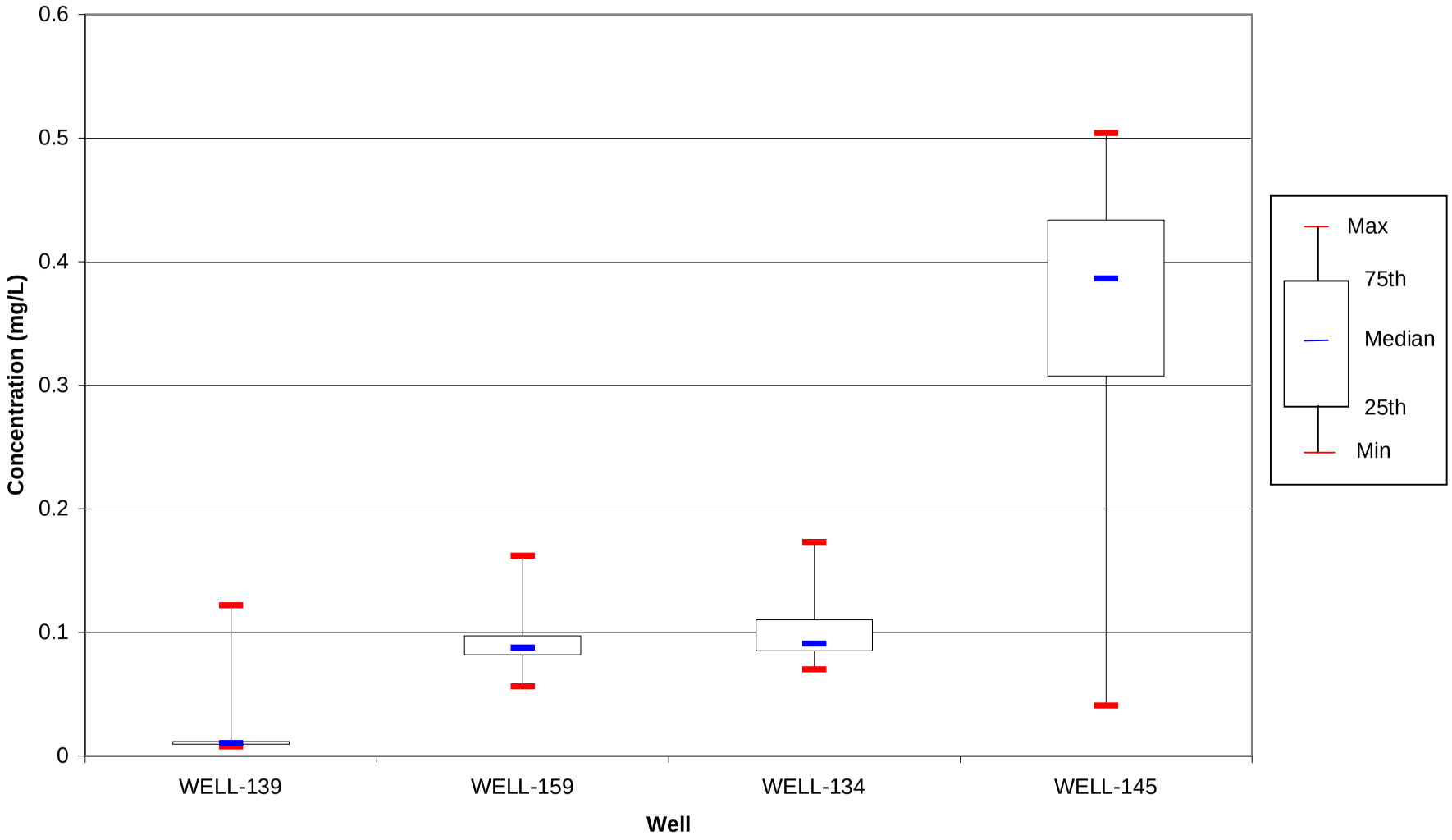
Qualifiers:
< - Measured Not Detected
U - Qualified Not Detected
J - Estimated

APPENDIX B

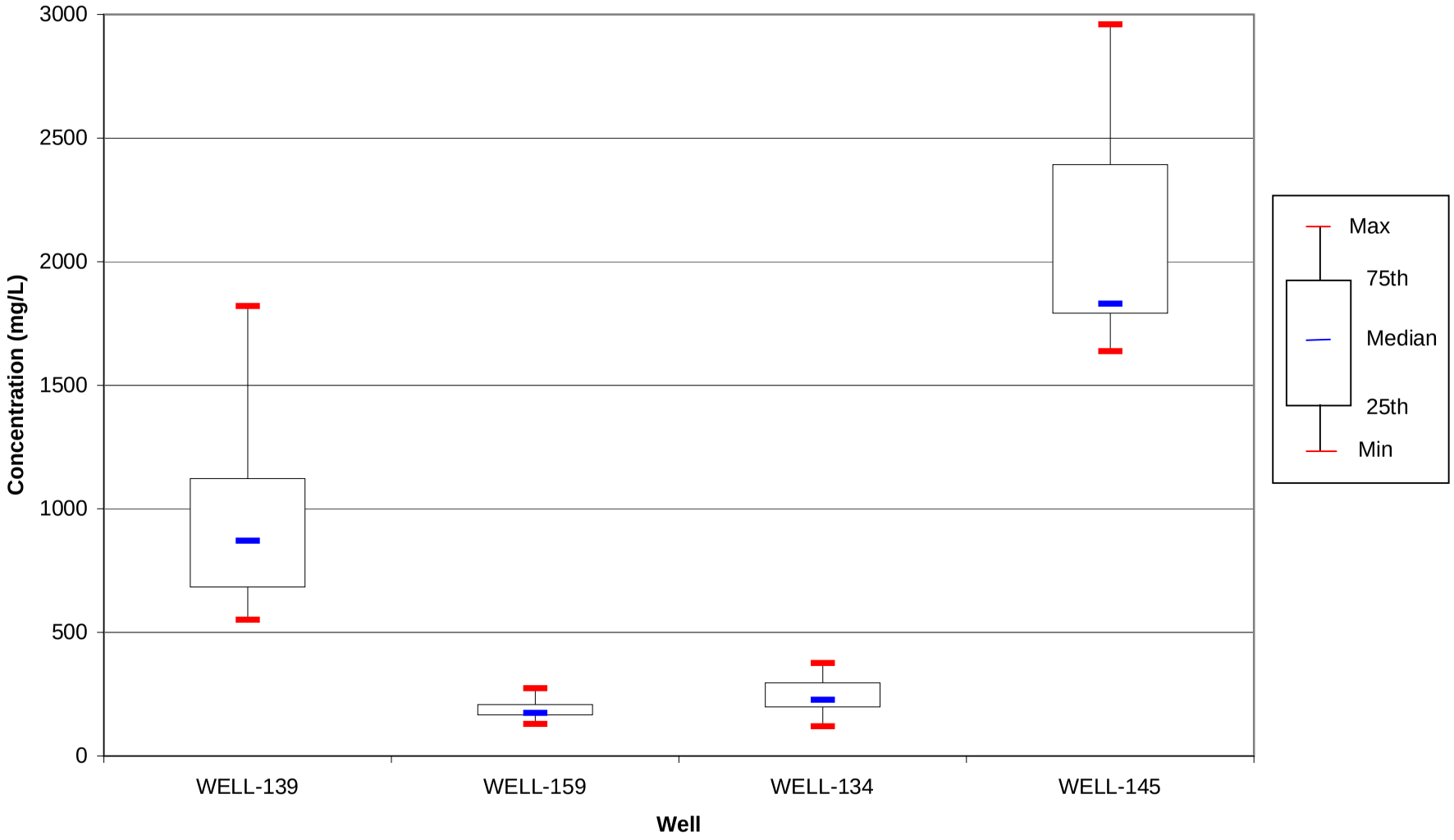
BOXPLOT SUMMARY GRAPHS FOR ARSENIC, POTASSIUM, SELENIUM, ORTHOPHOSPHATE, AND SULFATE

ON-PLANT / JOINT FENCELINE AREA WELLS

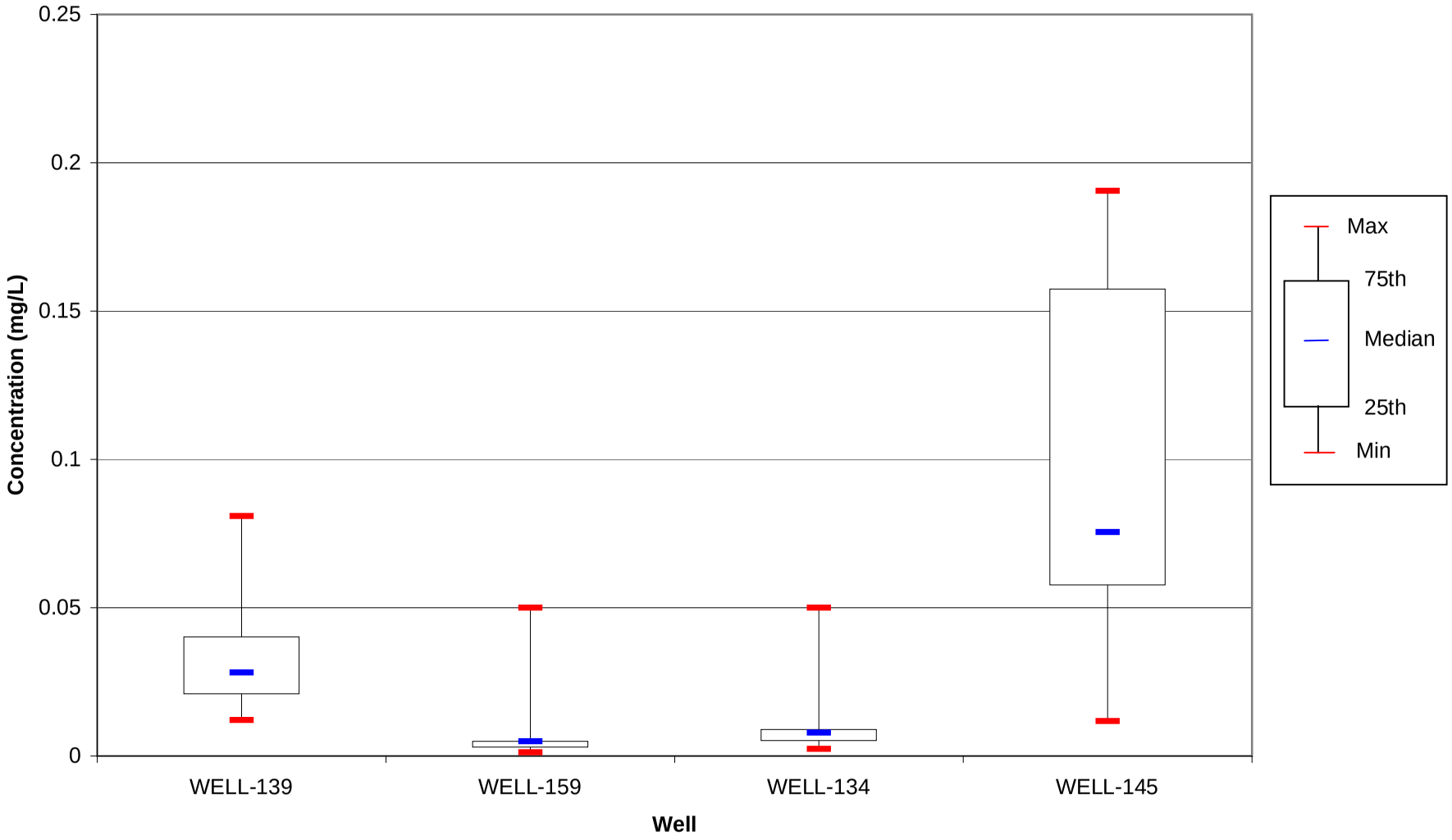
On Plant / Joint Fenceline Area Wells
Arsenic (Data through 2009)



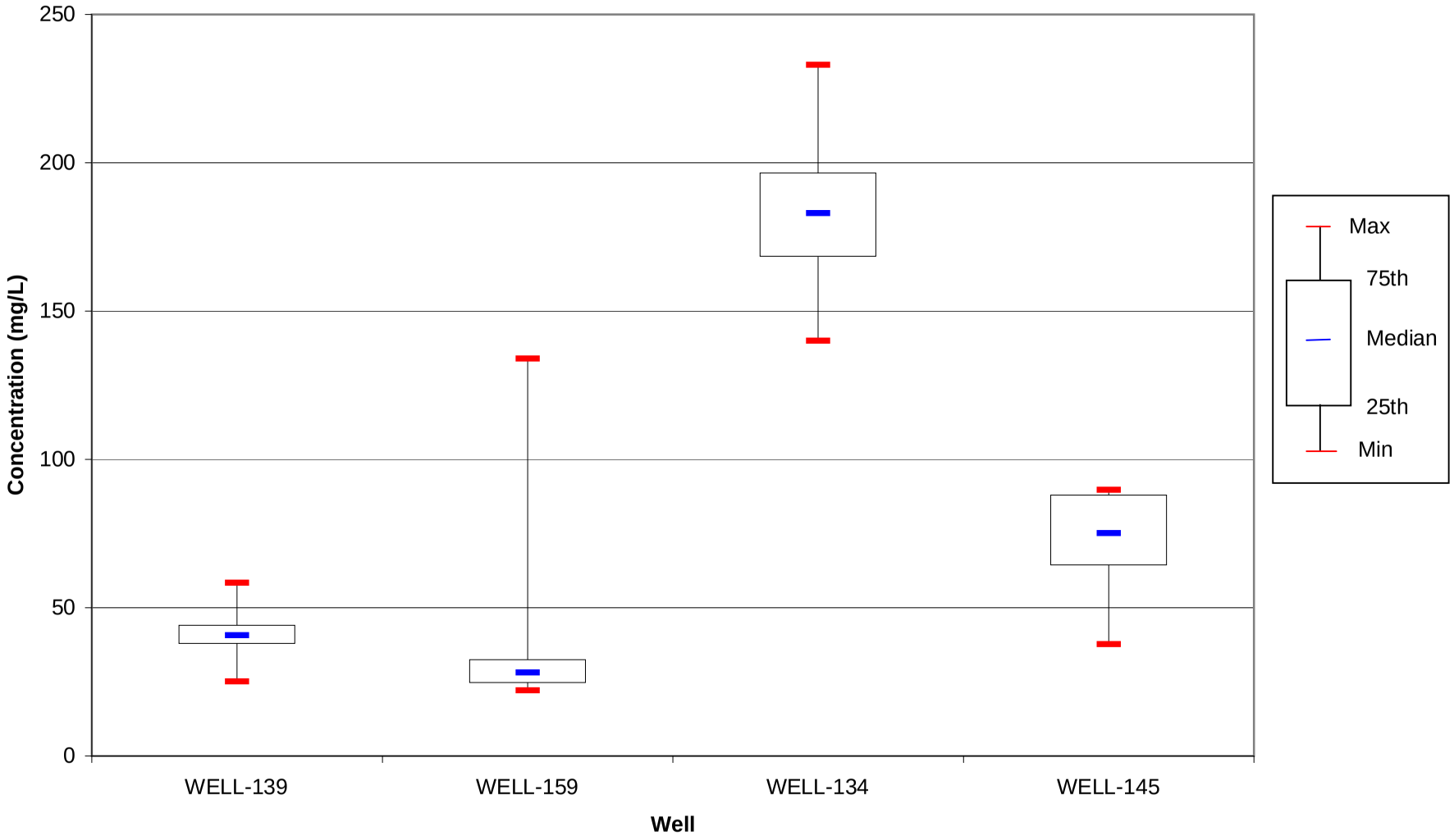
On Plant / Joint Fenceline Area Wells
Sulfate (Data through 2009)



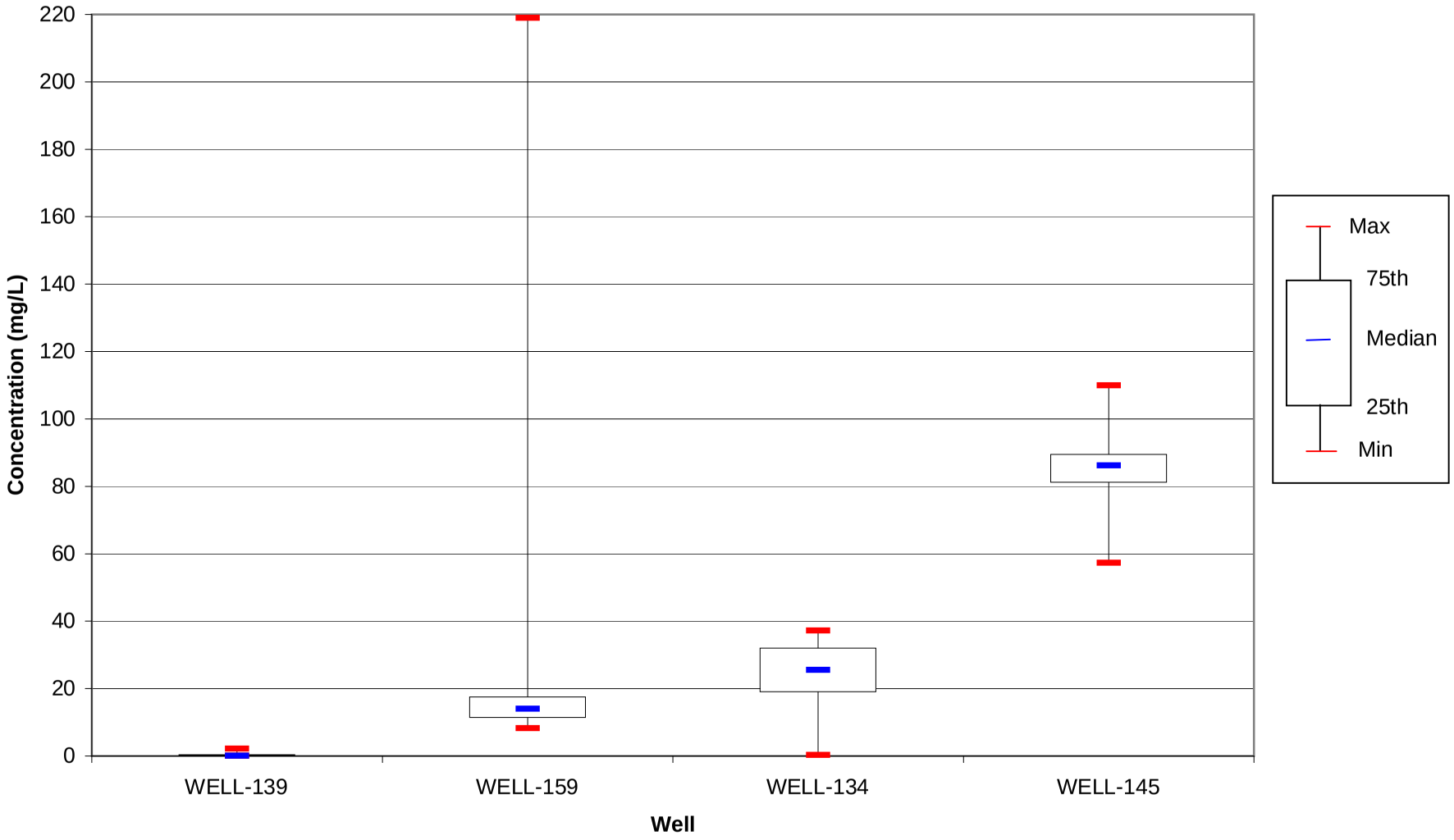
On Plant / Joint Fenceline Area Wells
Selenium (Data through 2009)



On Plant / Joint Fenceline Area Wells
Potassium (Data through 2009)

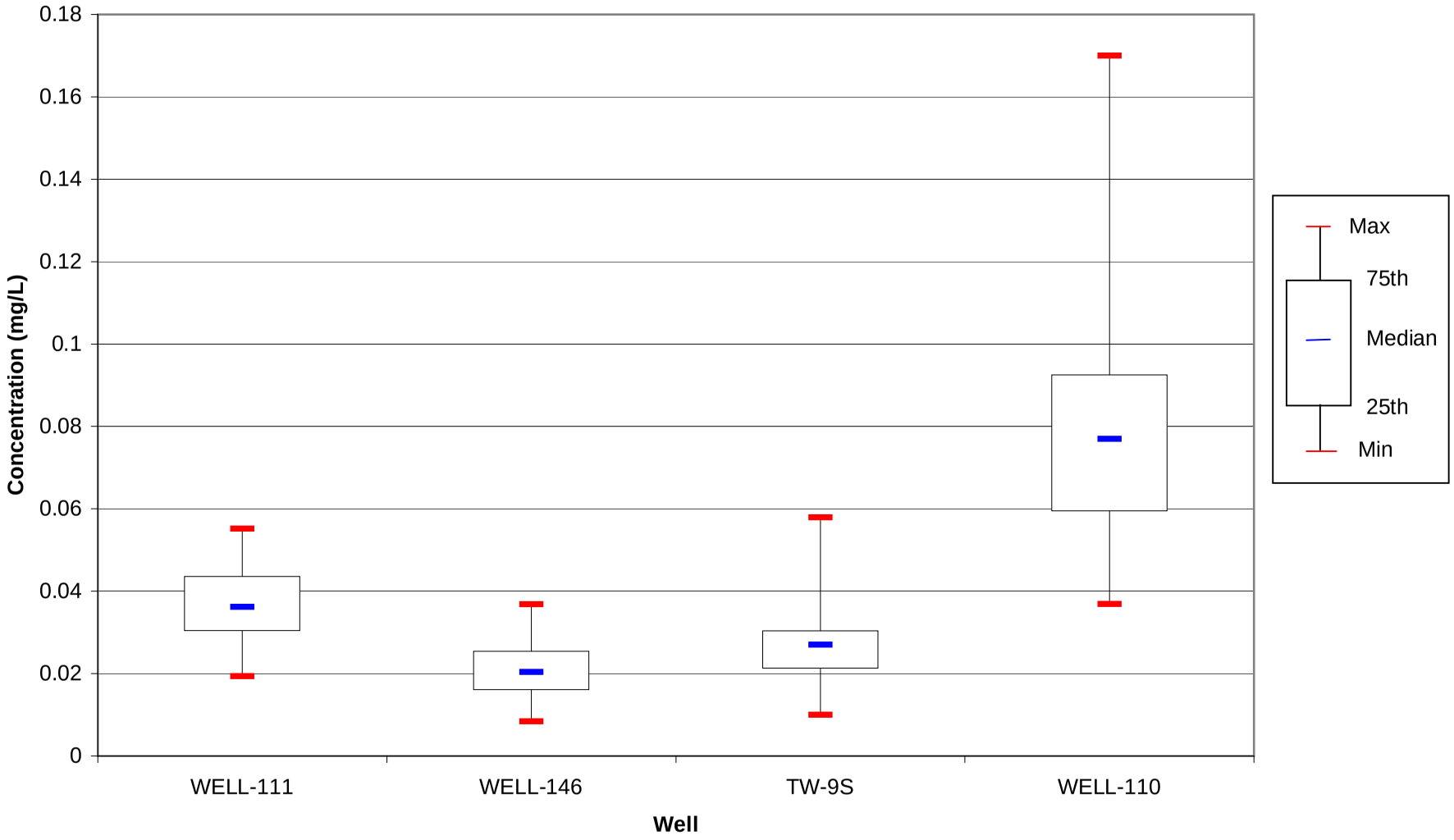


On Plant / Joint Fenceline Area Wells
Total Phosphorus / Orthophospate (Data through 2009)

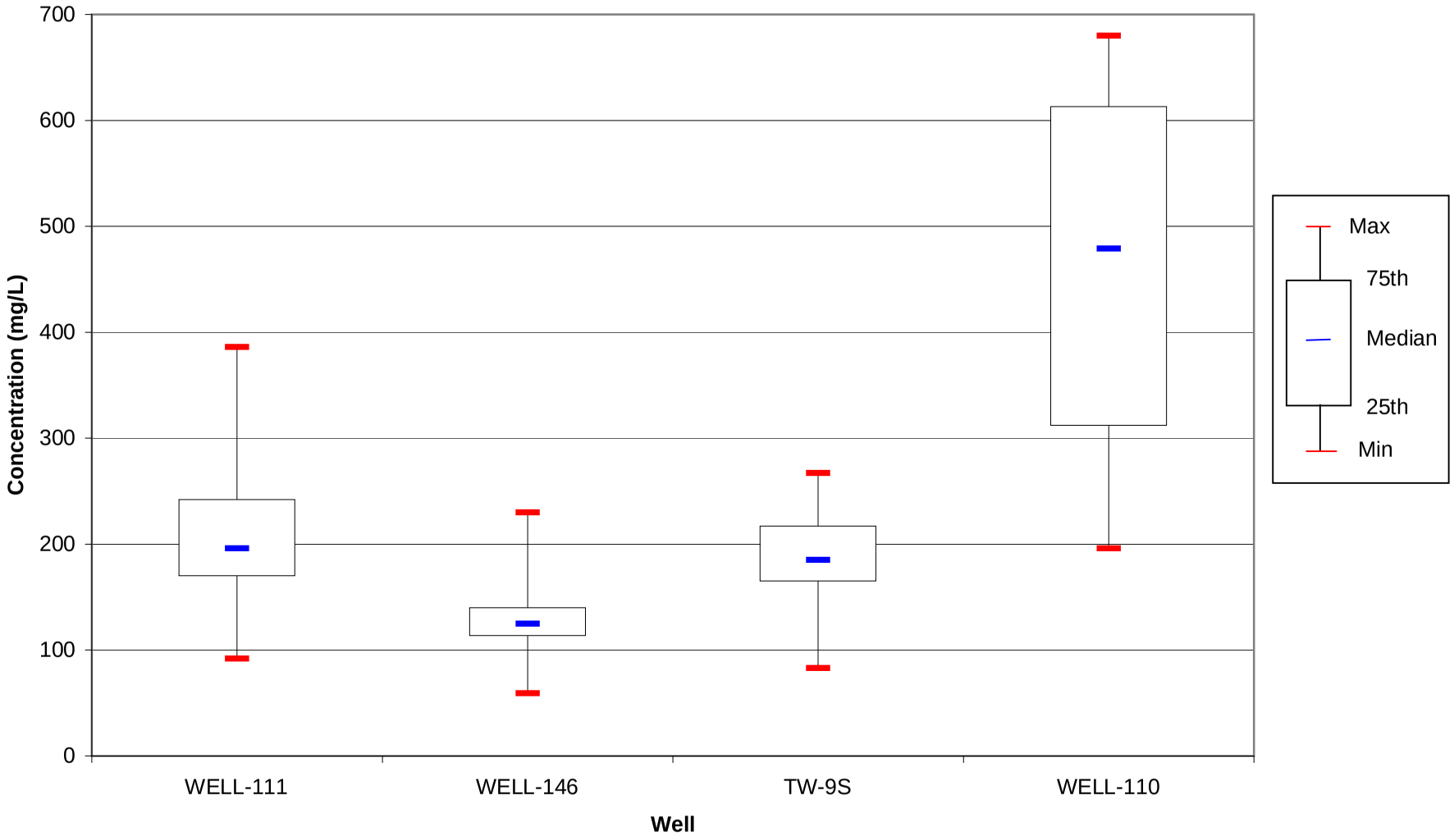


PLANT SITE DOWNGRADIENT WELLS

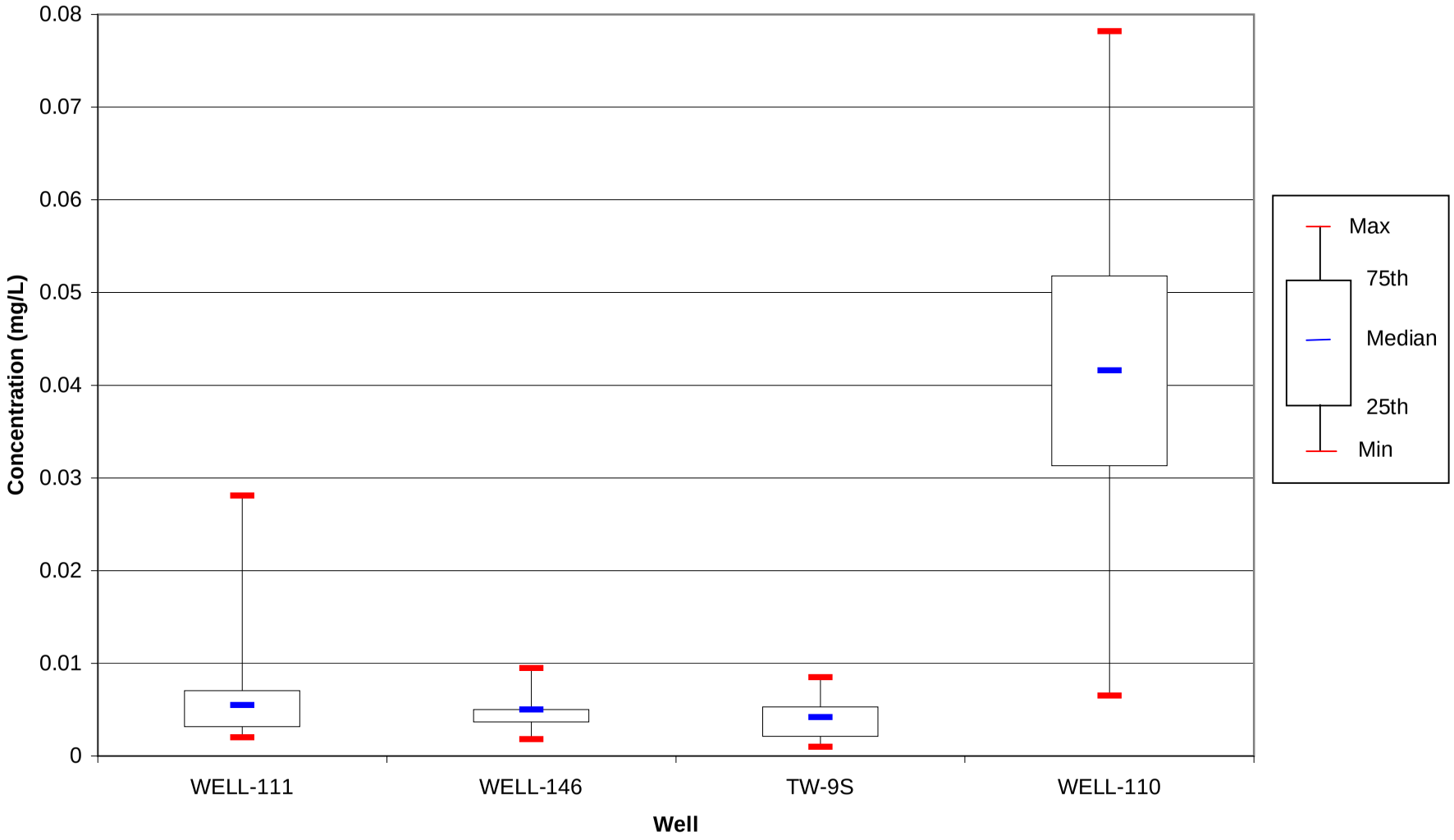
Plant Site Downgradient Wells
Arsenic (Data through 2009)



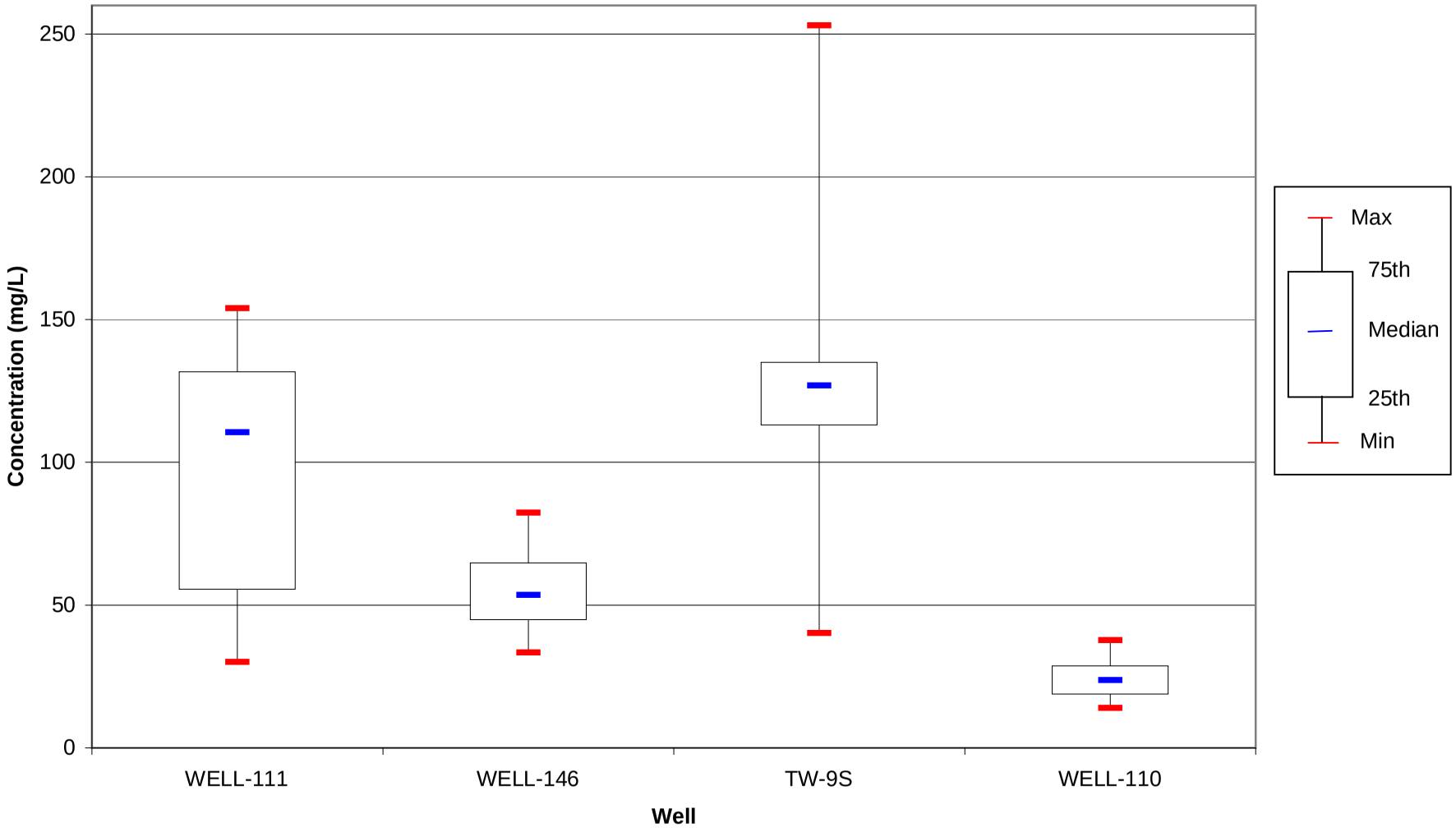
Plant Site Downgradient Wells
Sulfate (Data through 2009)



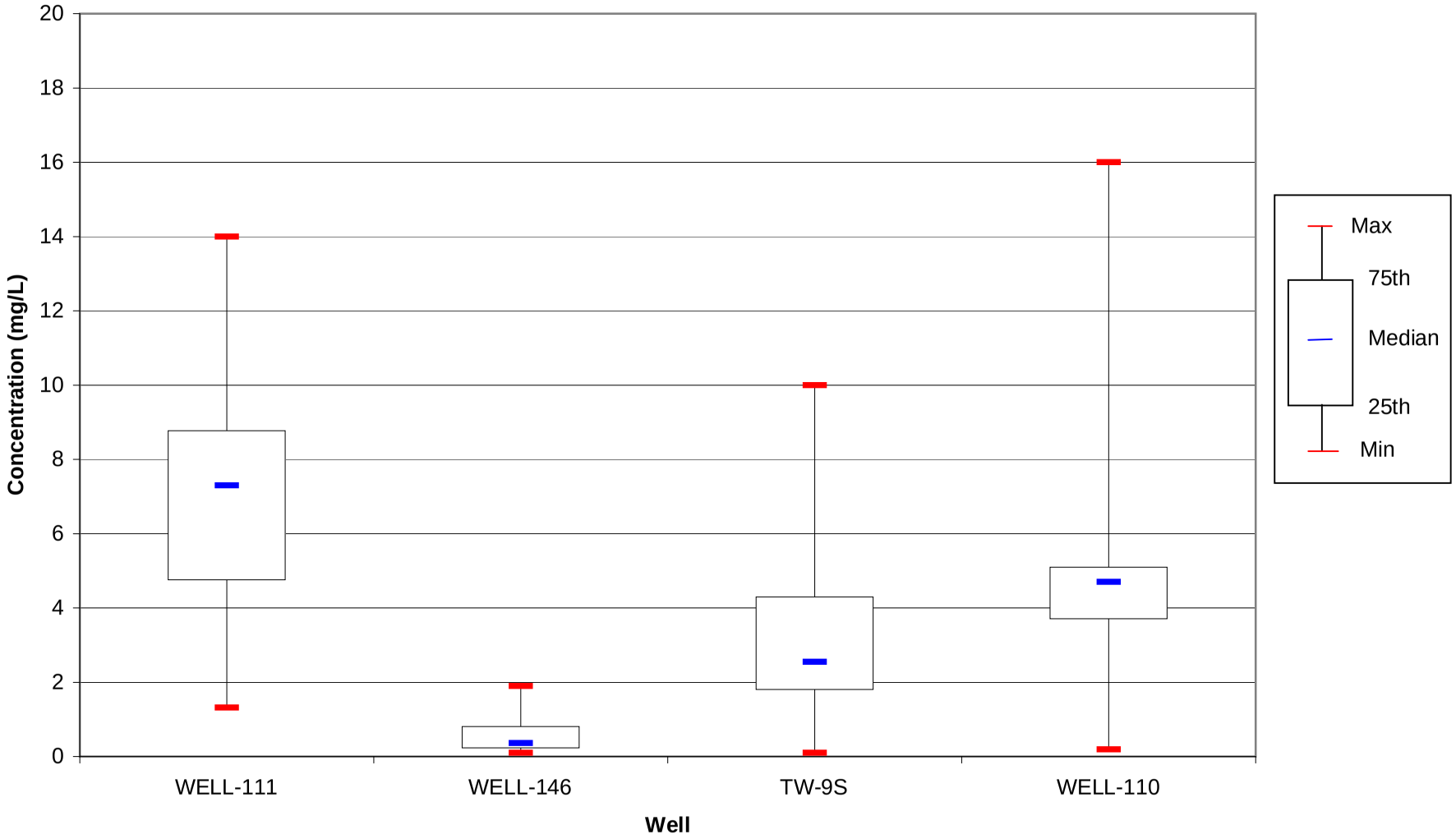
Plant Site Downgradient Wells
Selenium (Data through 2009)



Plant Site Downgradient Wells
Potassium (Data through 2009)

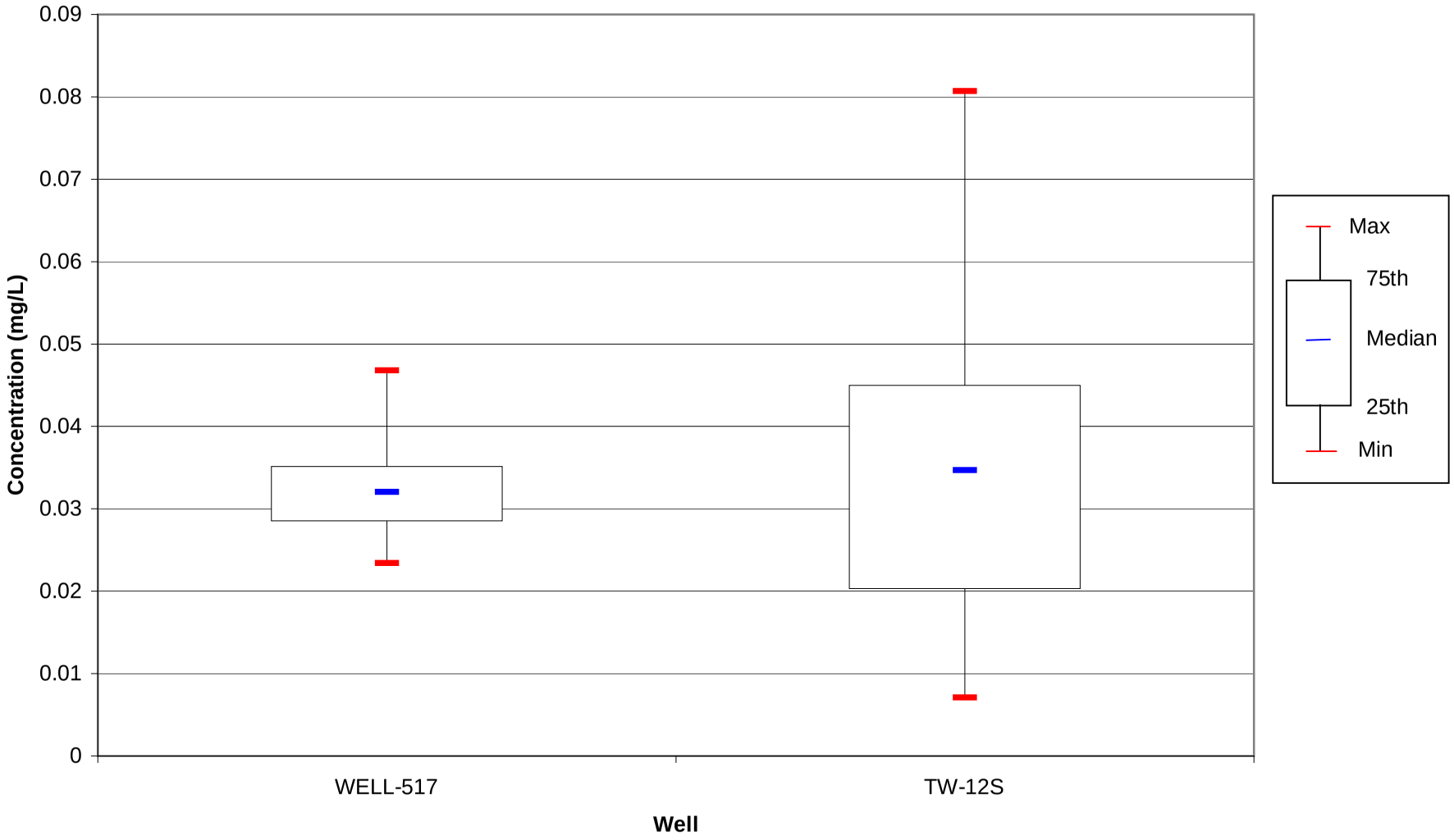


Plant Site Downgradient Wells
Total Phosphorus / Orthophosphate (Data through 2009)

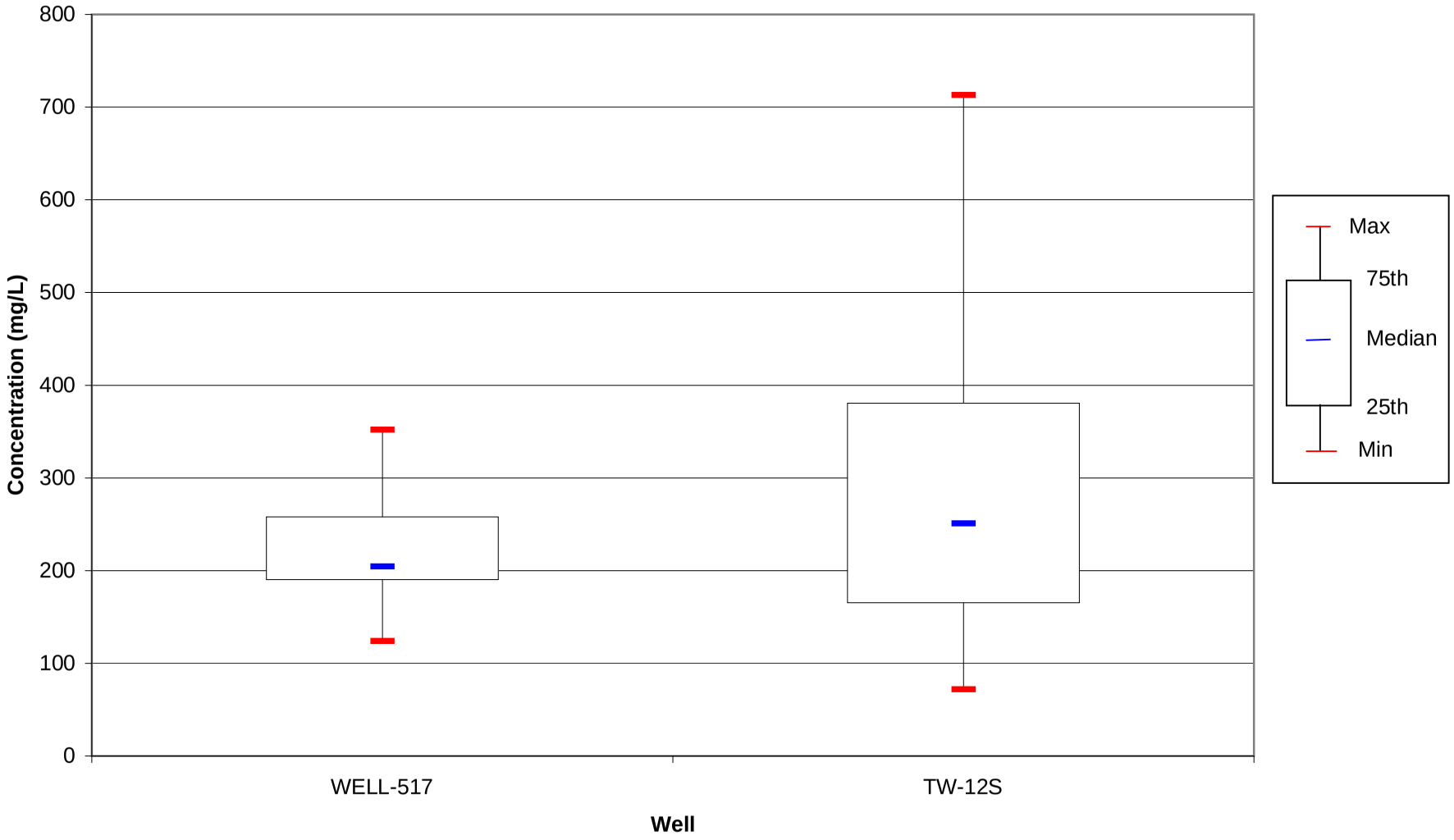


WELLS DOWNGRADIENT OF FMC AND SIMPLOT PLANT SITES

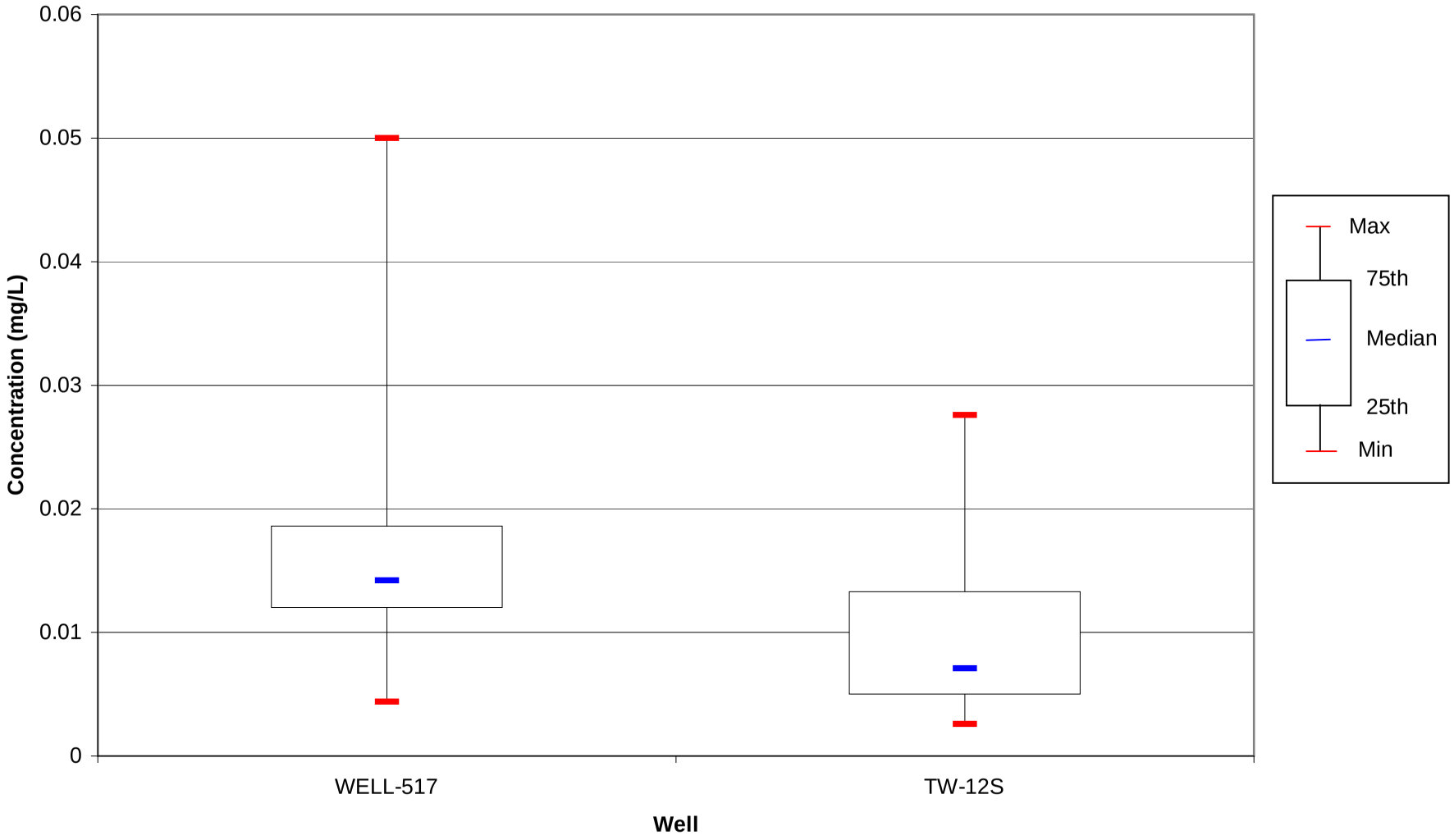
Wells Downgradient of FMC and Simplot Plant Sites
Arsenic (Data through 2009)



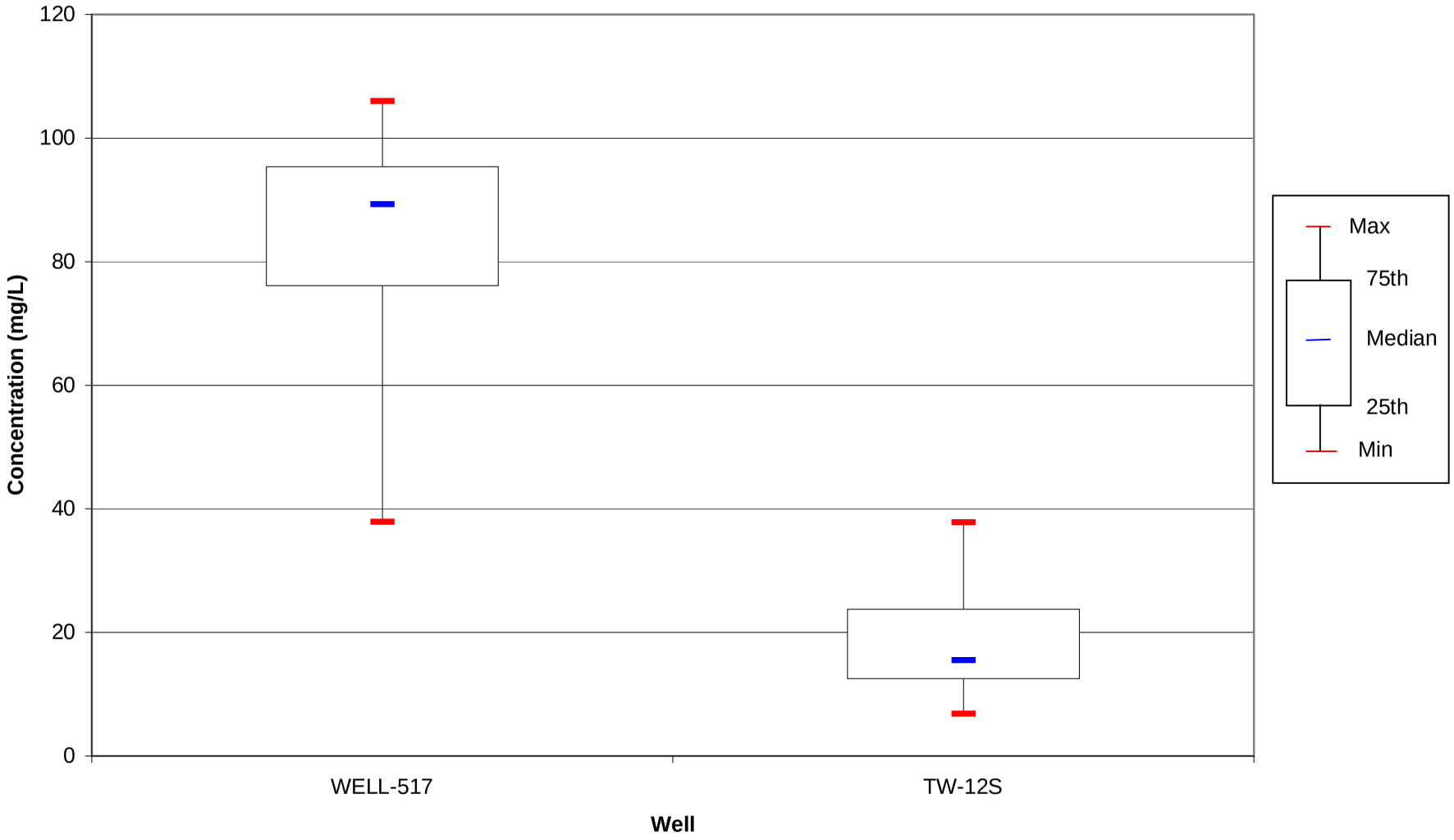
Wells Downgradient of FMC and Simplot Plant Sites
Sulfate (Data through 2009)



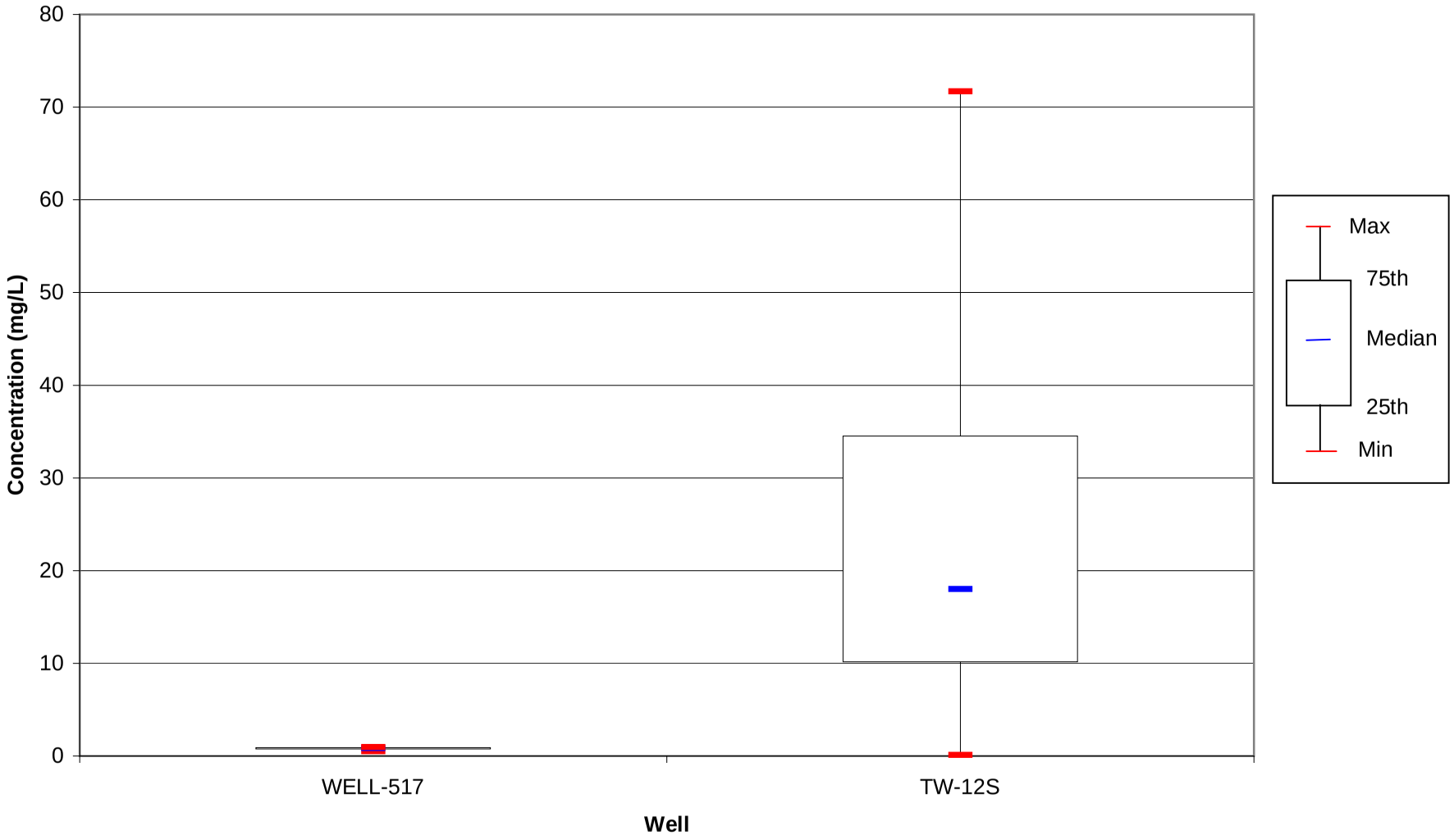
Wells Downgradient of FMC and Simplot Plant Sites
Selenium (Data through 2009)



Wells Downgradient of FMC and Simplot Plant Sites
Potassium (Data through 2009)

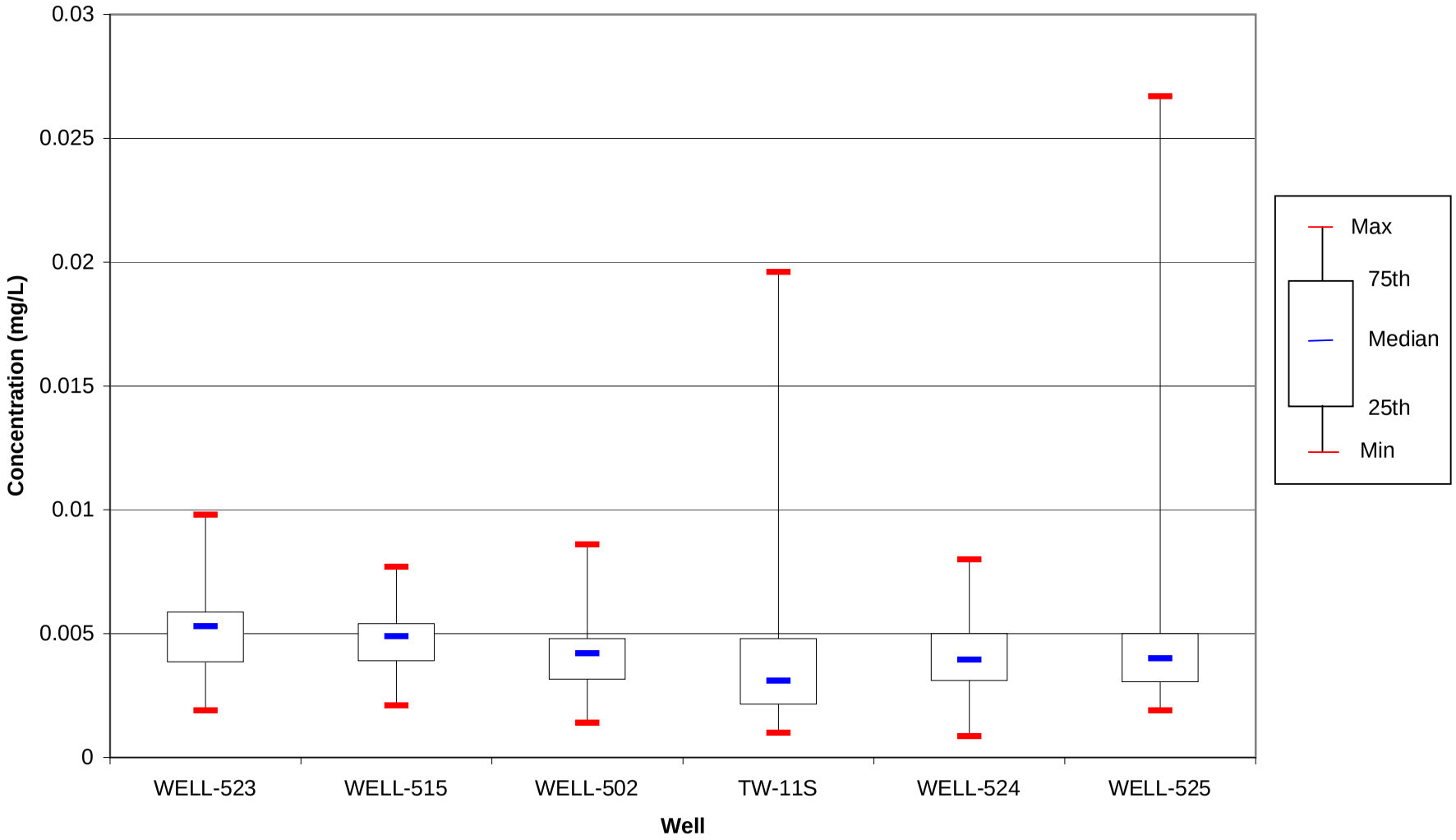


Wells Downgradient of FMC and Simplot Plant Sites
Total Phosphorus / Orthophosphate (Data through 2009)

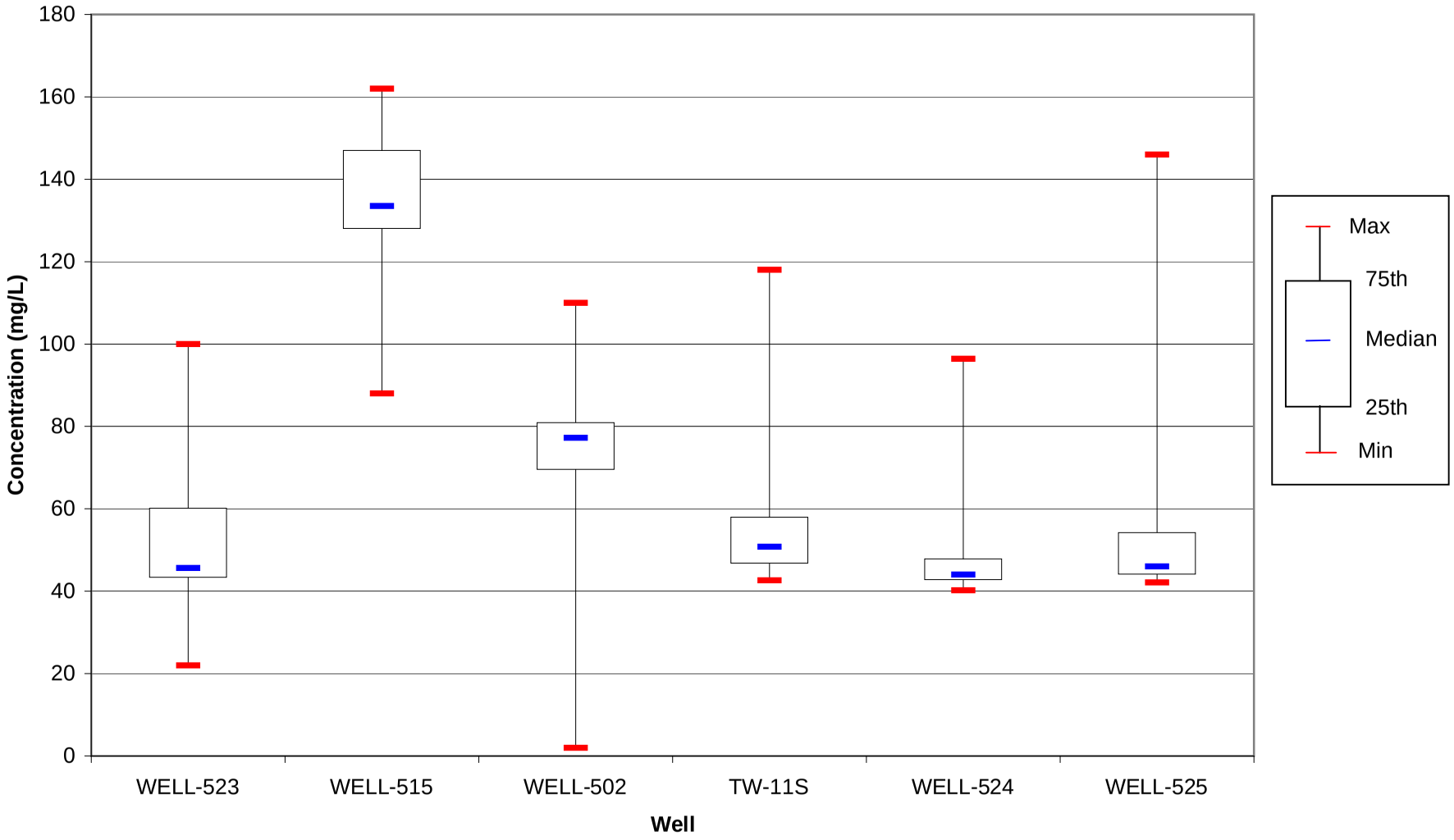


NORTHERN PERIMETER WELLS

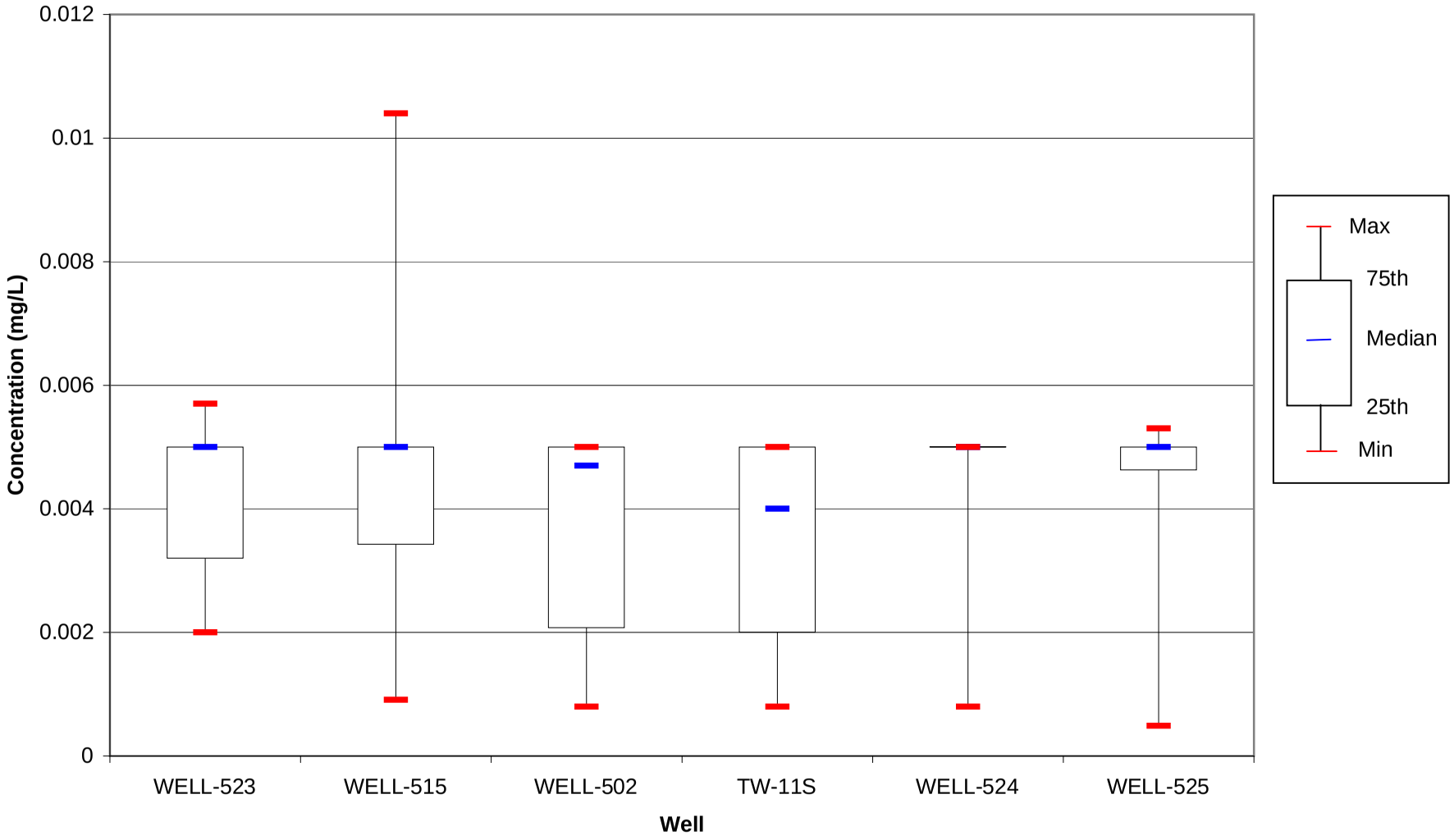
Northern Perimeter Wells
Arsenic (Data through 2009)



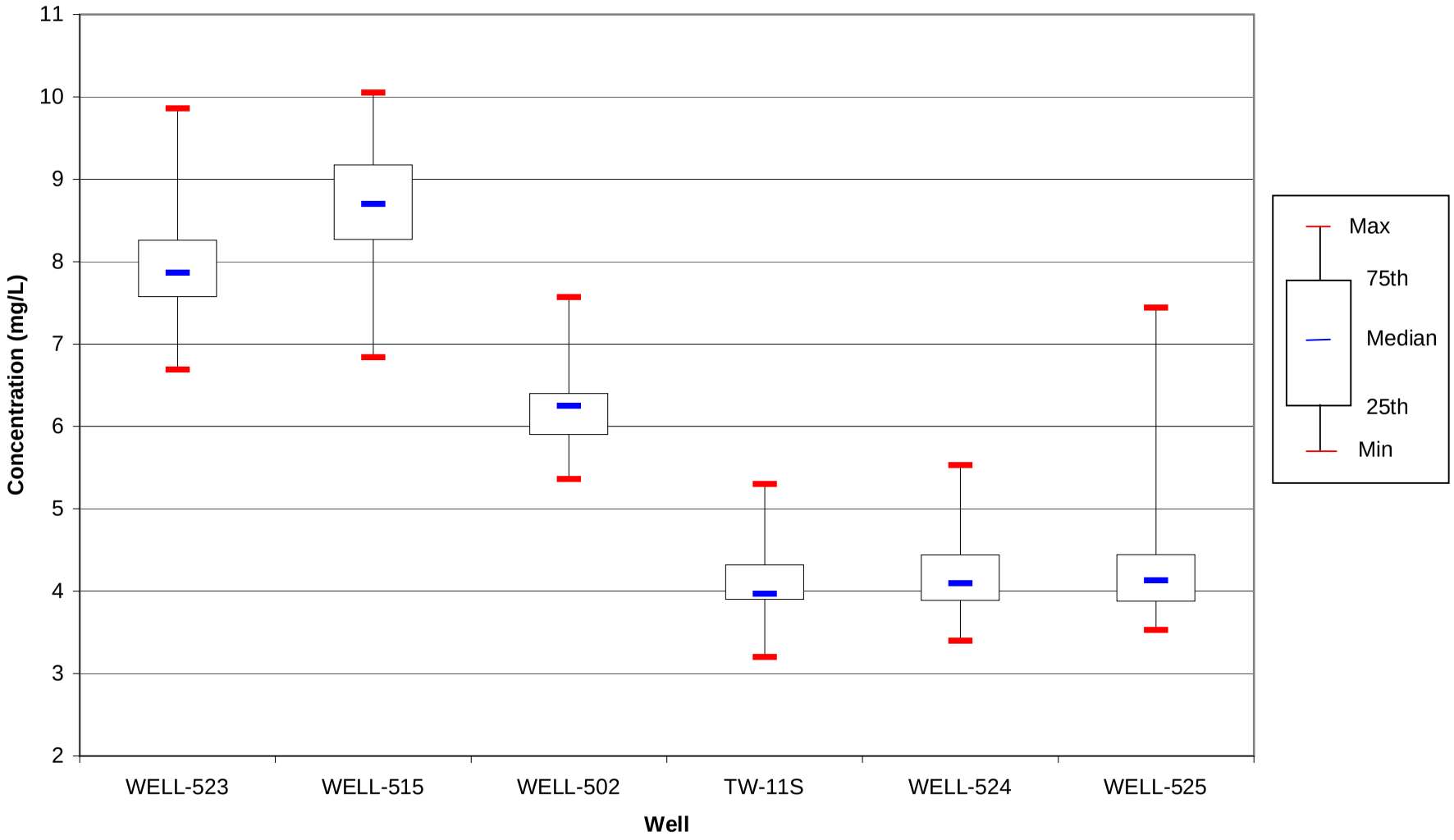
Northern Perimeter Wells
Sulfate (Data through 2009)



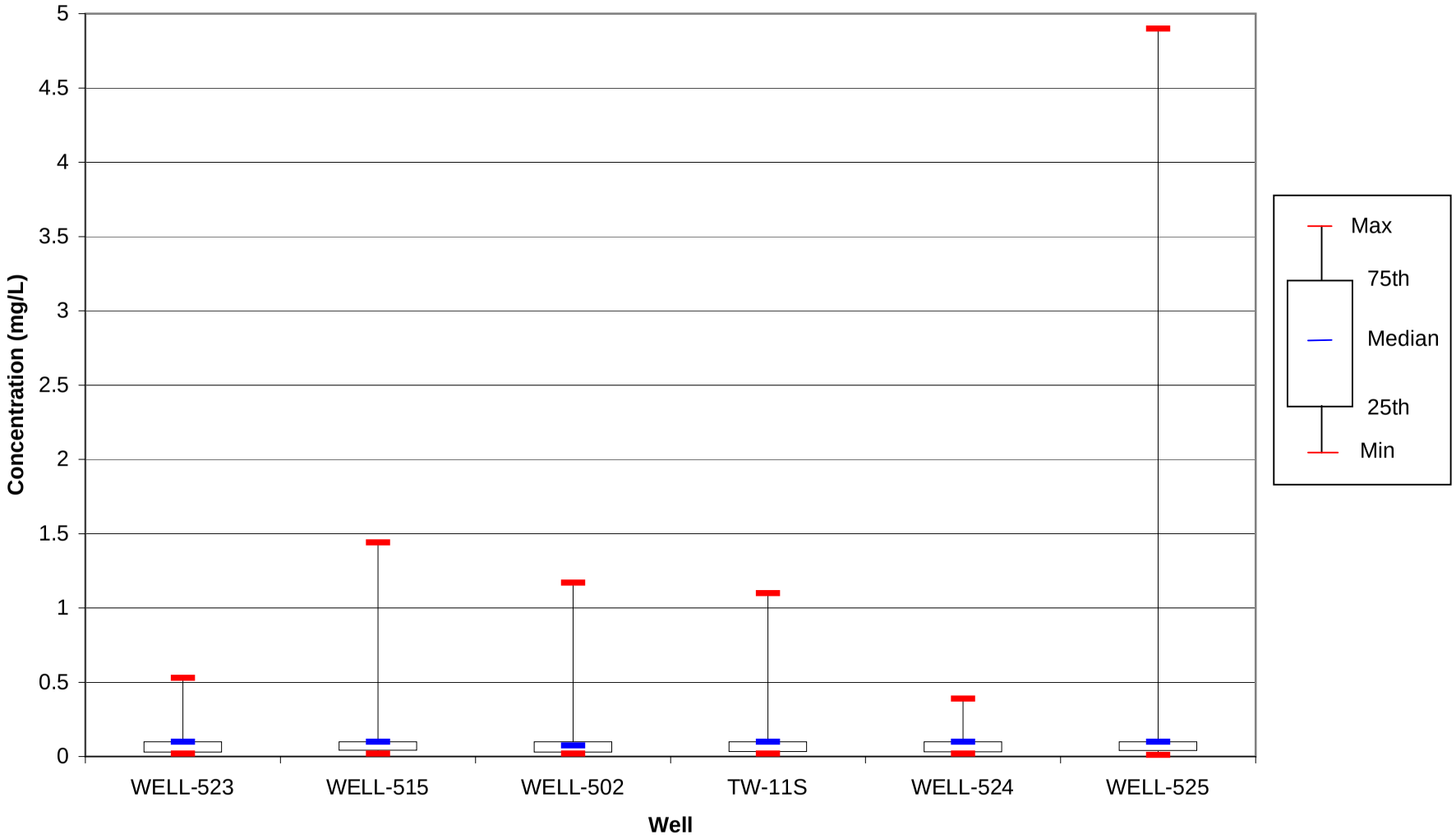
Northern Perimeter Wells
Selenium (Data through 2009)



Northern Perimeter Wells
Potassium (Data through 2009)



Northern Perimeter Wells
Total Phosphorus / Orthophosphate (Data through 2009)



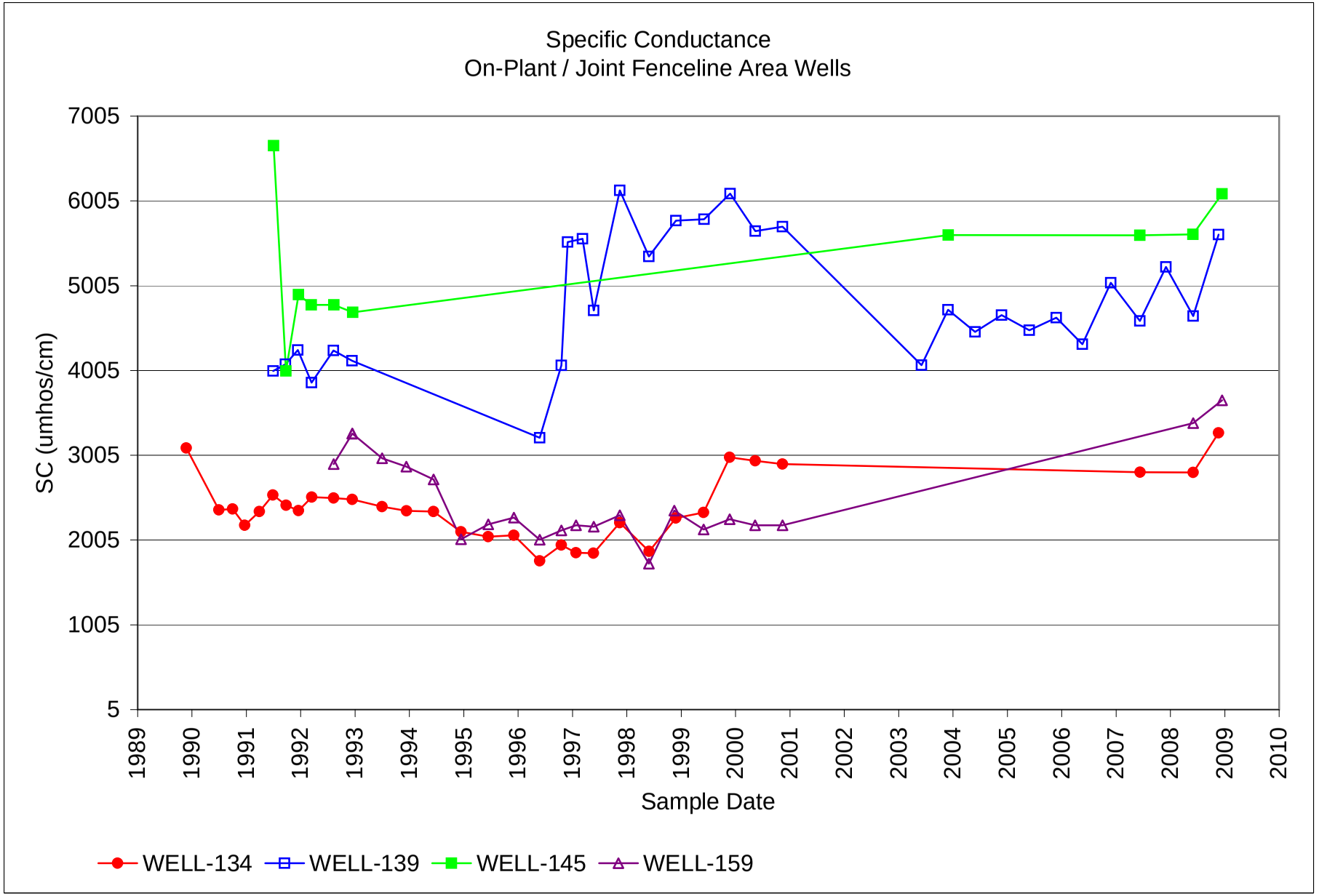
APPENDIX C

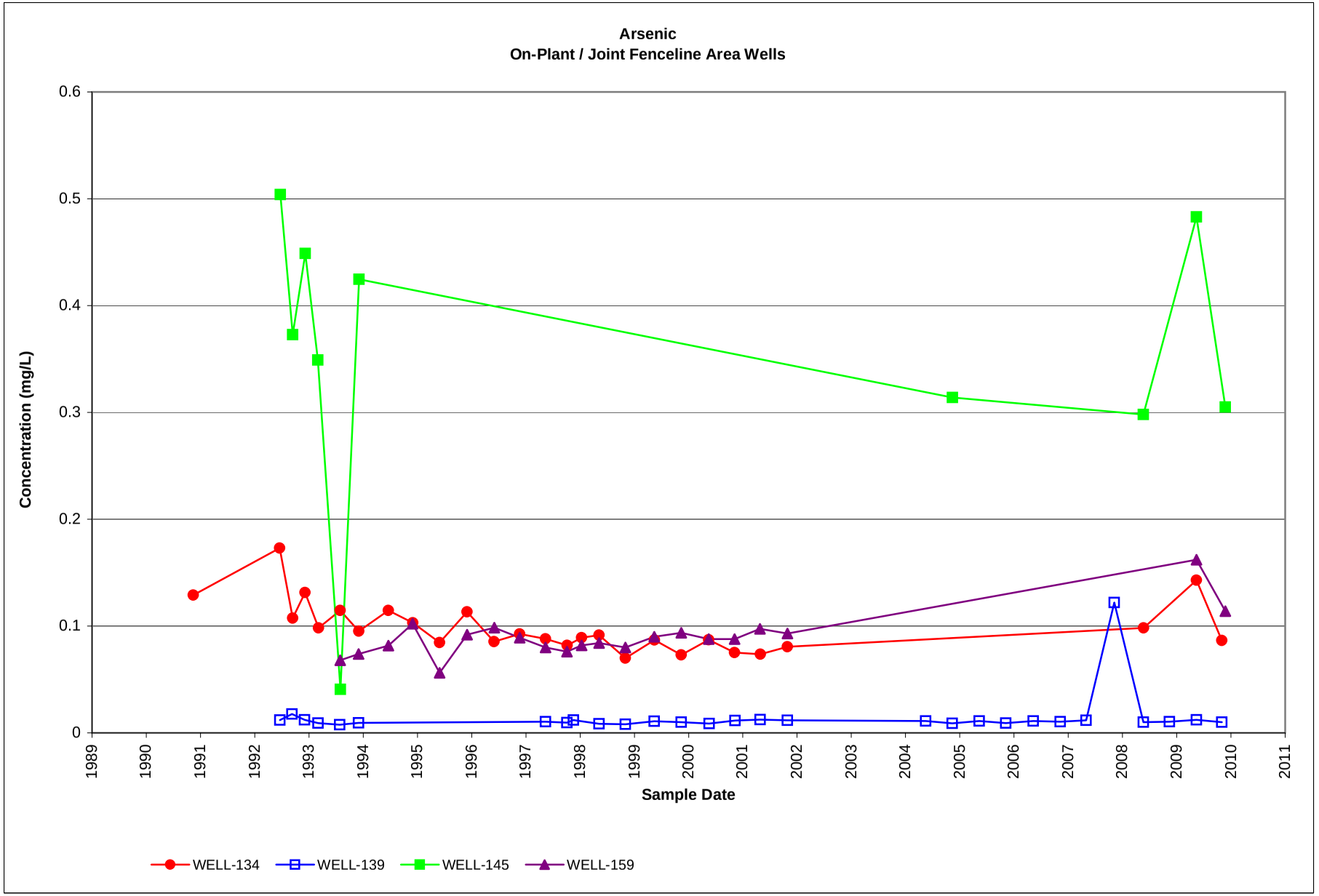
GROUNDWATER QUALITY TREND PLOTS FOR pH, SPECIFIC CONDUCTANCE, ARSENIC, POTASSIUM, SELENIUM, PHOSPHORUS, AND SULFATE

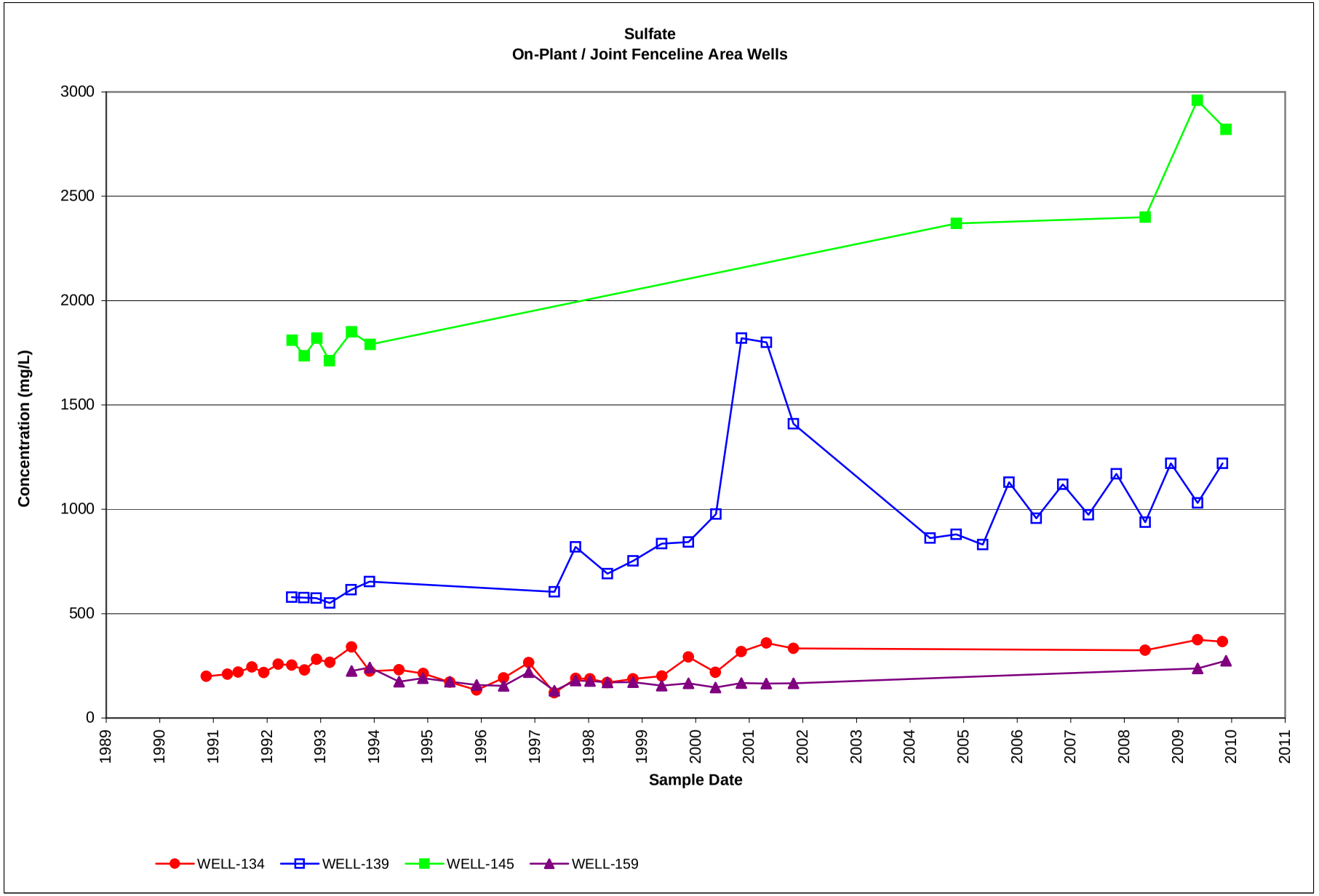
Note: Time series plot concentration scales are variable depending on concentrations.

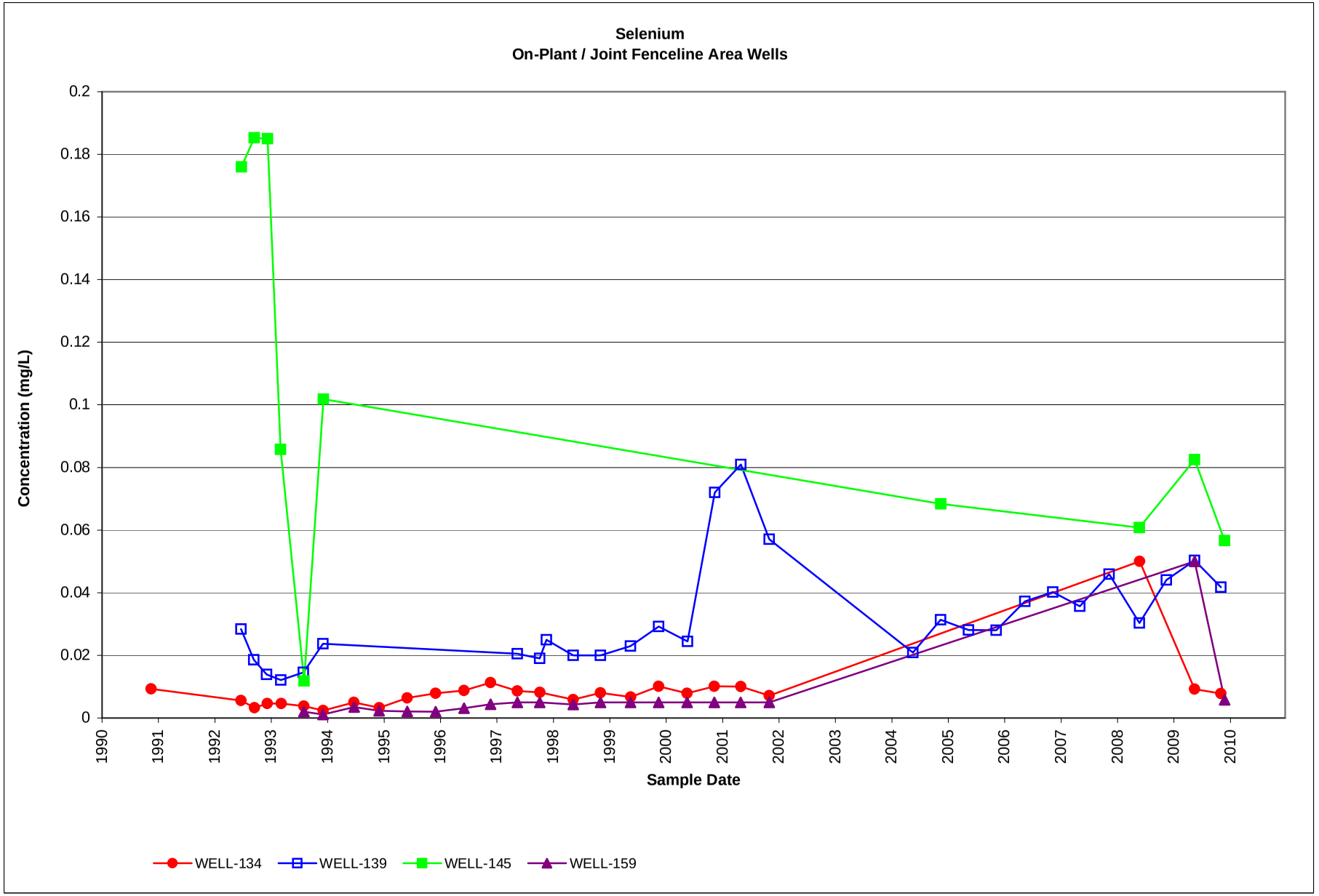
ON-PLANT / JOINT FENCELINE AREA WELLS

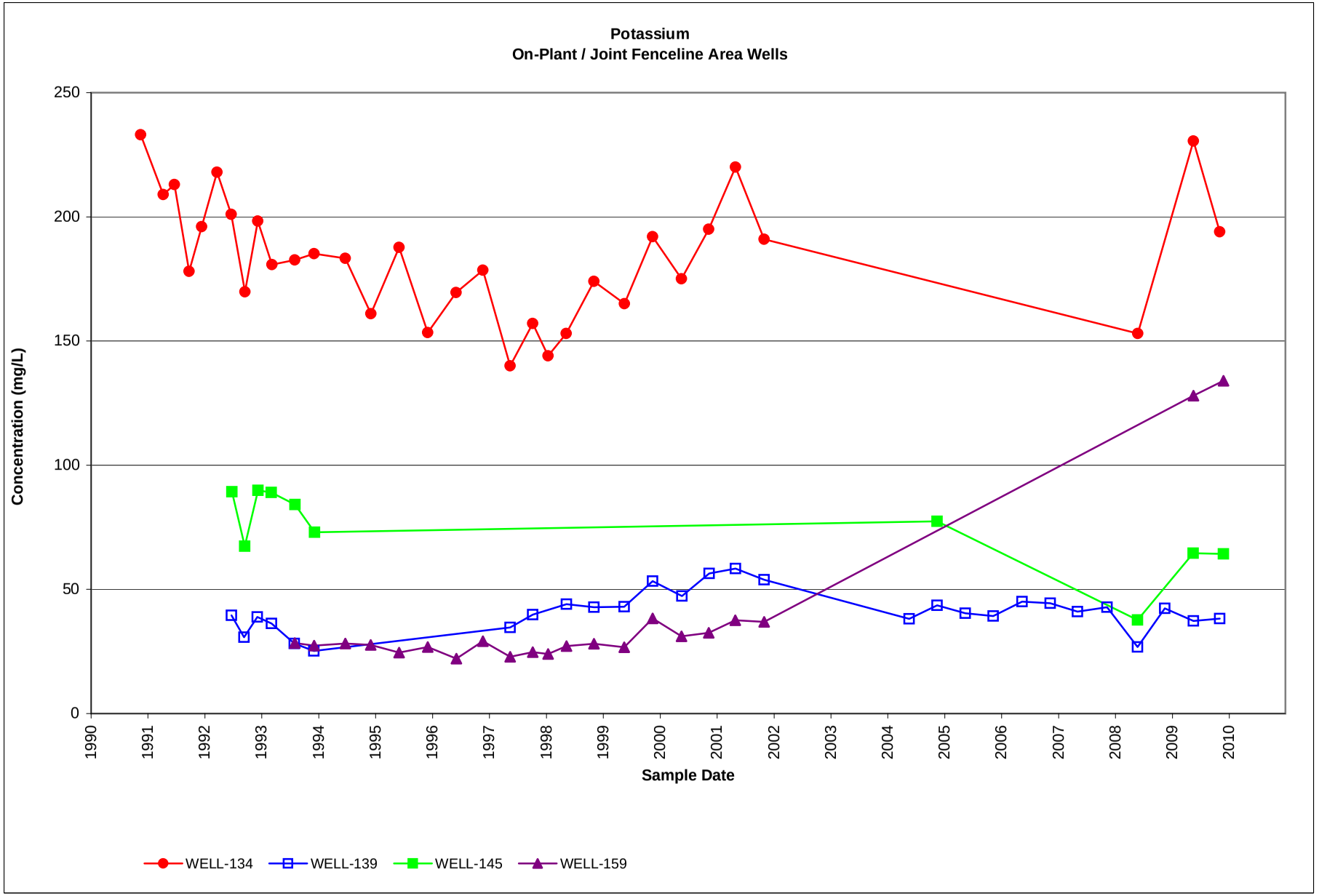

pH
On-Plant / Joint Fenceline Area Wells
pH (standard units)
8
7.5
7
6.5
6
5.5
5
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
WELL-134
WELL-139
WELL-145
WELL-159

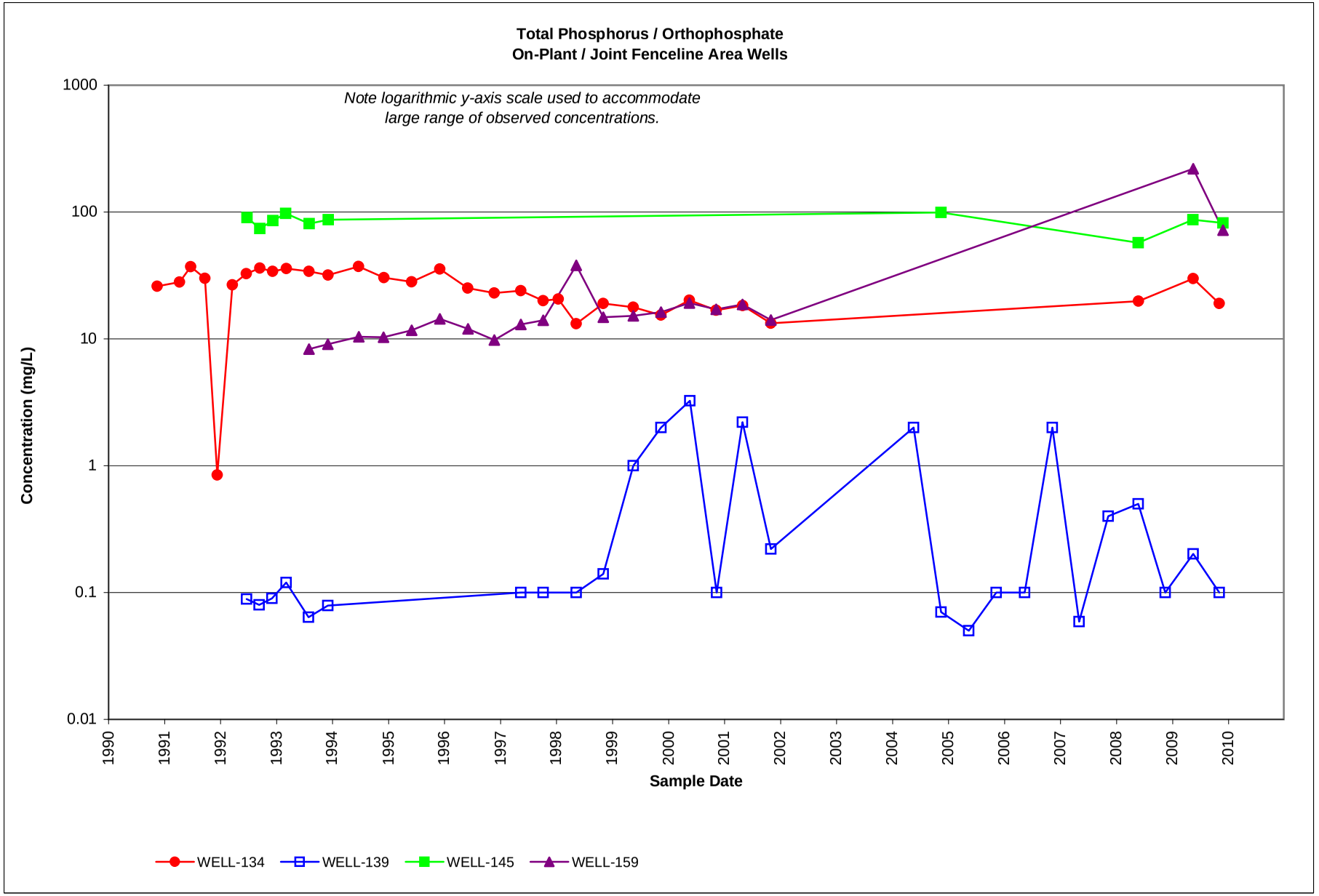

Specific Conductance
On-Plant / Joint Fenceline Area Wells
SC (umhos/cm)
7005
6005
5005
4005
3005
2005
1005
5
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
WELL-134
WELL-139
WELL-145
WELL-159


Arsenic
On-Plant / Joint Fenceline Area Wells
Concentration (mg/L)
0.6
0.5
0.4
0.3
0.2
0.1
0
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Sample Date
WELL-134
WELL-139
WELL-145
WELL-159

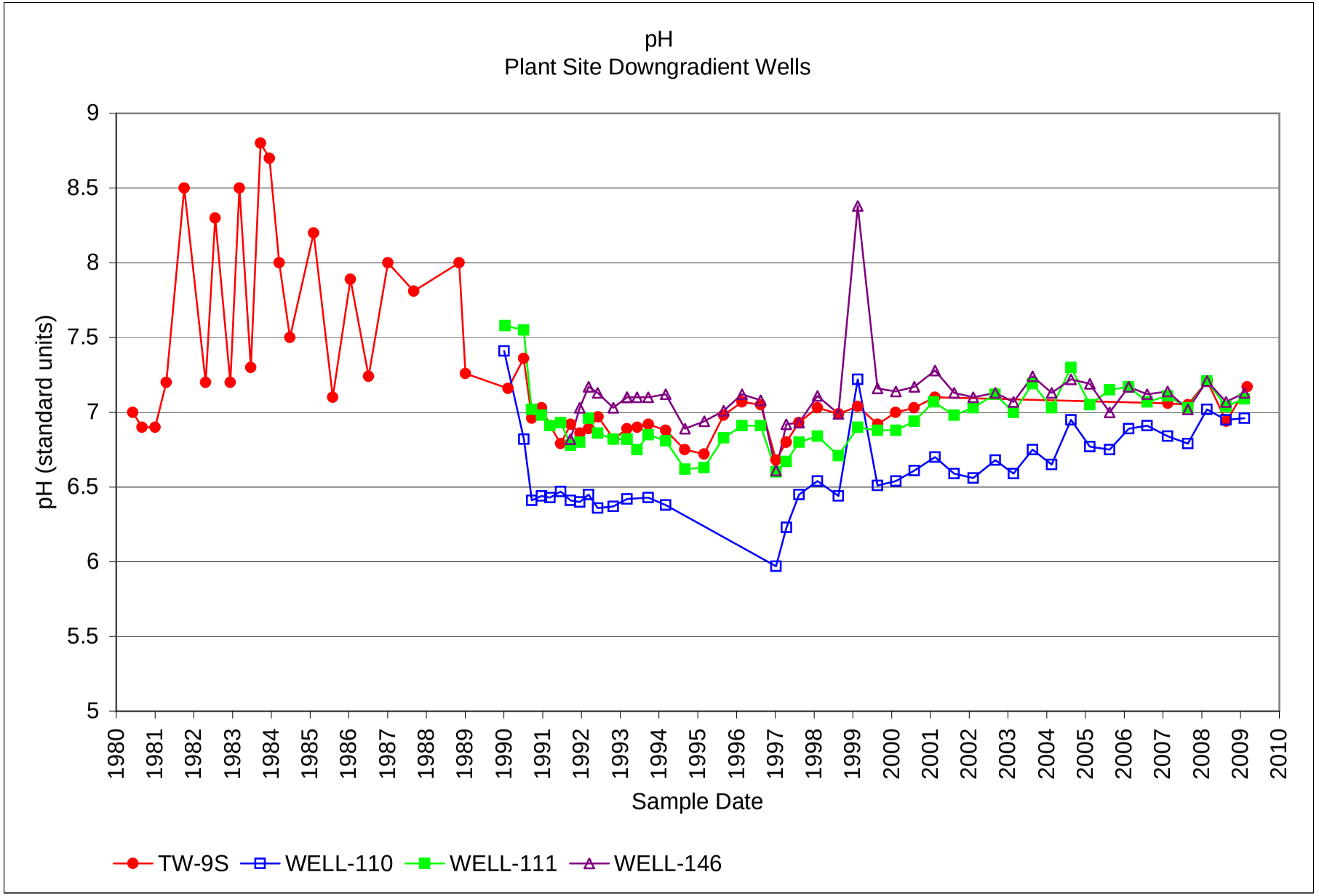

Sulfate
On-Plant / Joint Fenceline Area Wells
Concentration (mg/L)
3000
2500
2000
1500
1000
500
0
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Sample Date
WELL-134
WELL-139
WELL-145
WELL-159

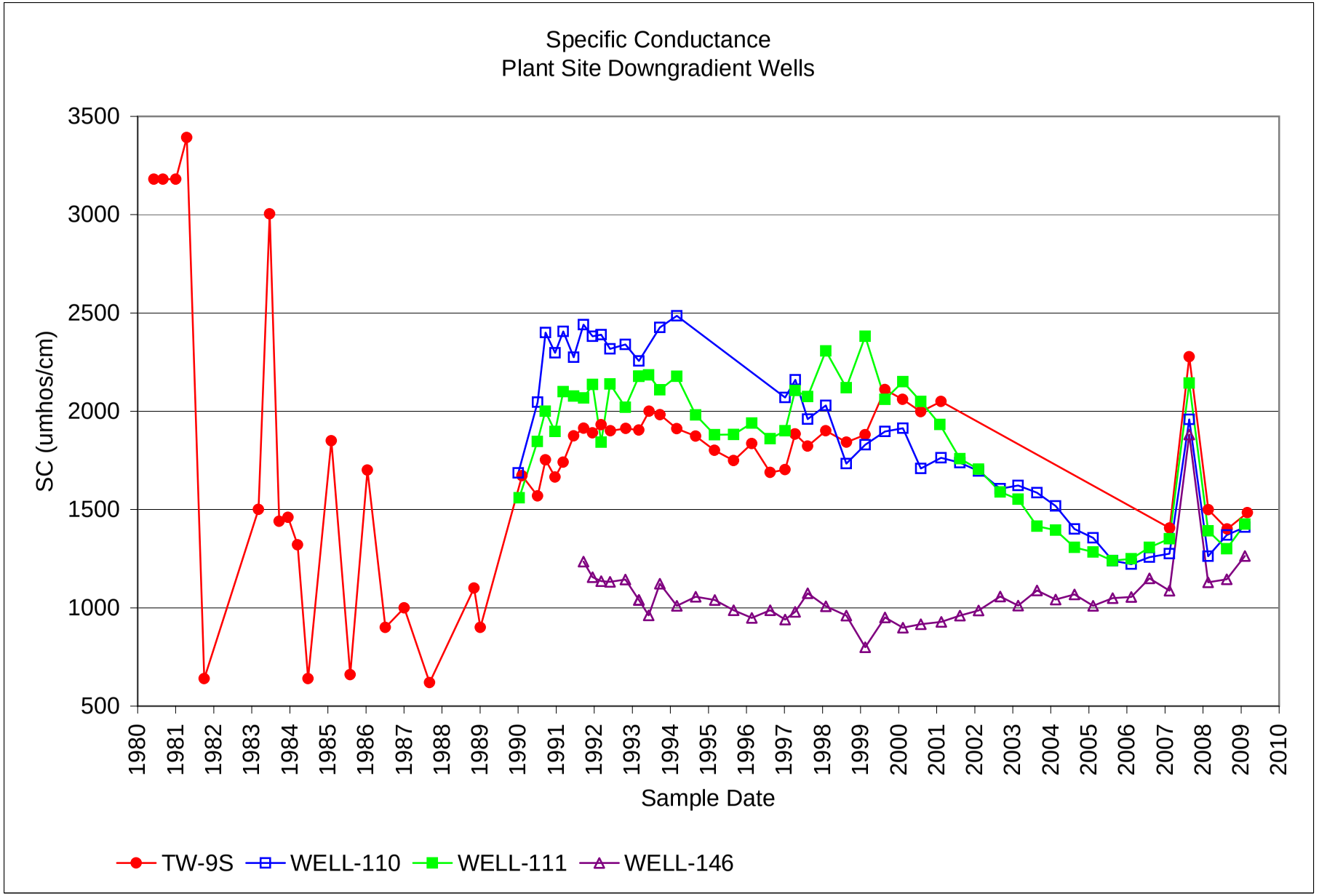

Selenium
On-Plant / Joint Fenceline Area Wells
Concentration (mg/L)
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
WELL-134
WELL-139
WELL-145
WELL-159

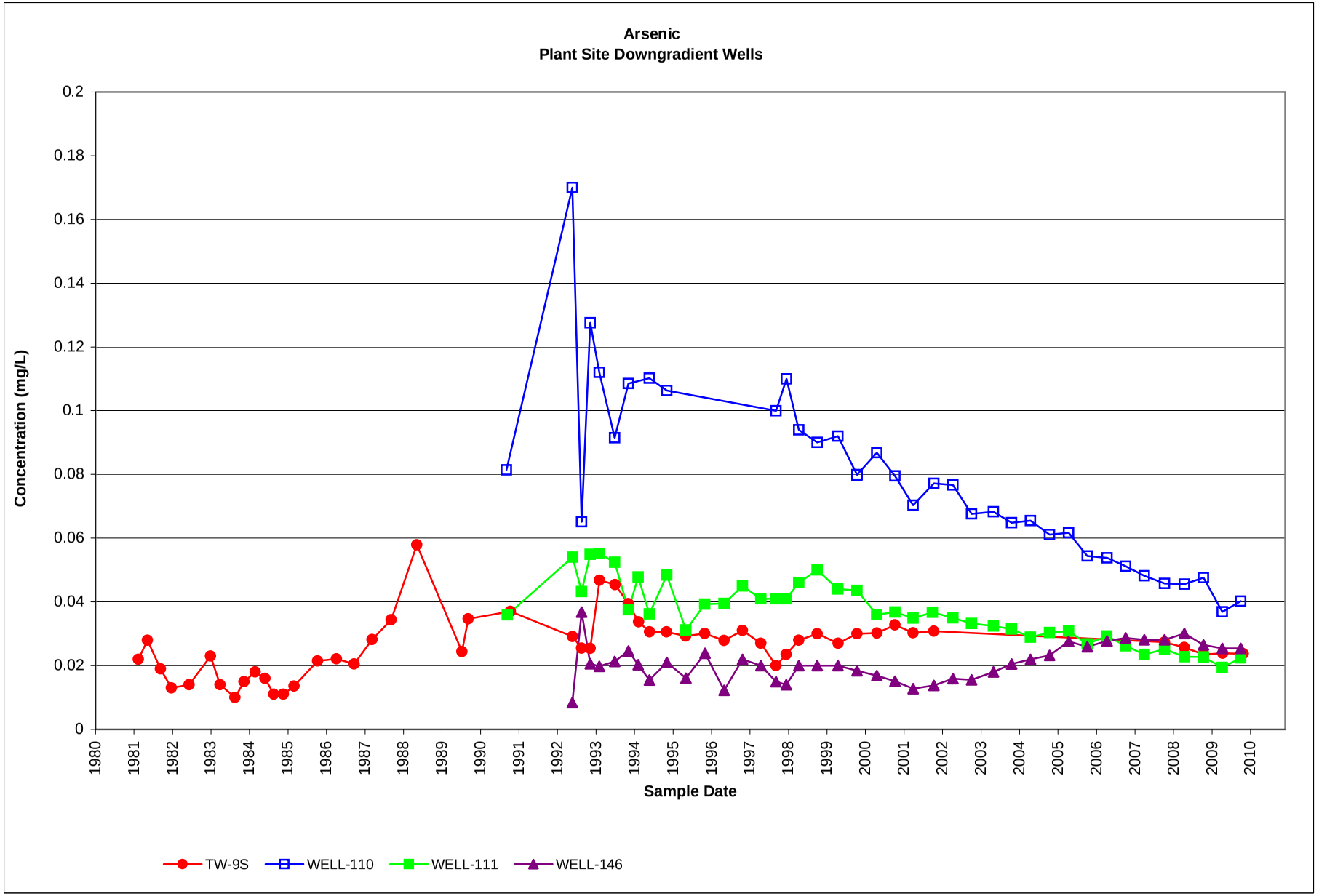

Potassium
On-Plant / Joint Fenceline Area Wells
Concentration (mg/L)
250
200
150
100
50
0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
WELL-134
WELL-139
WELL-145
WELL-159

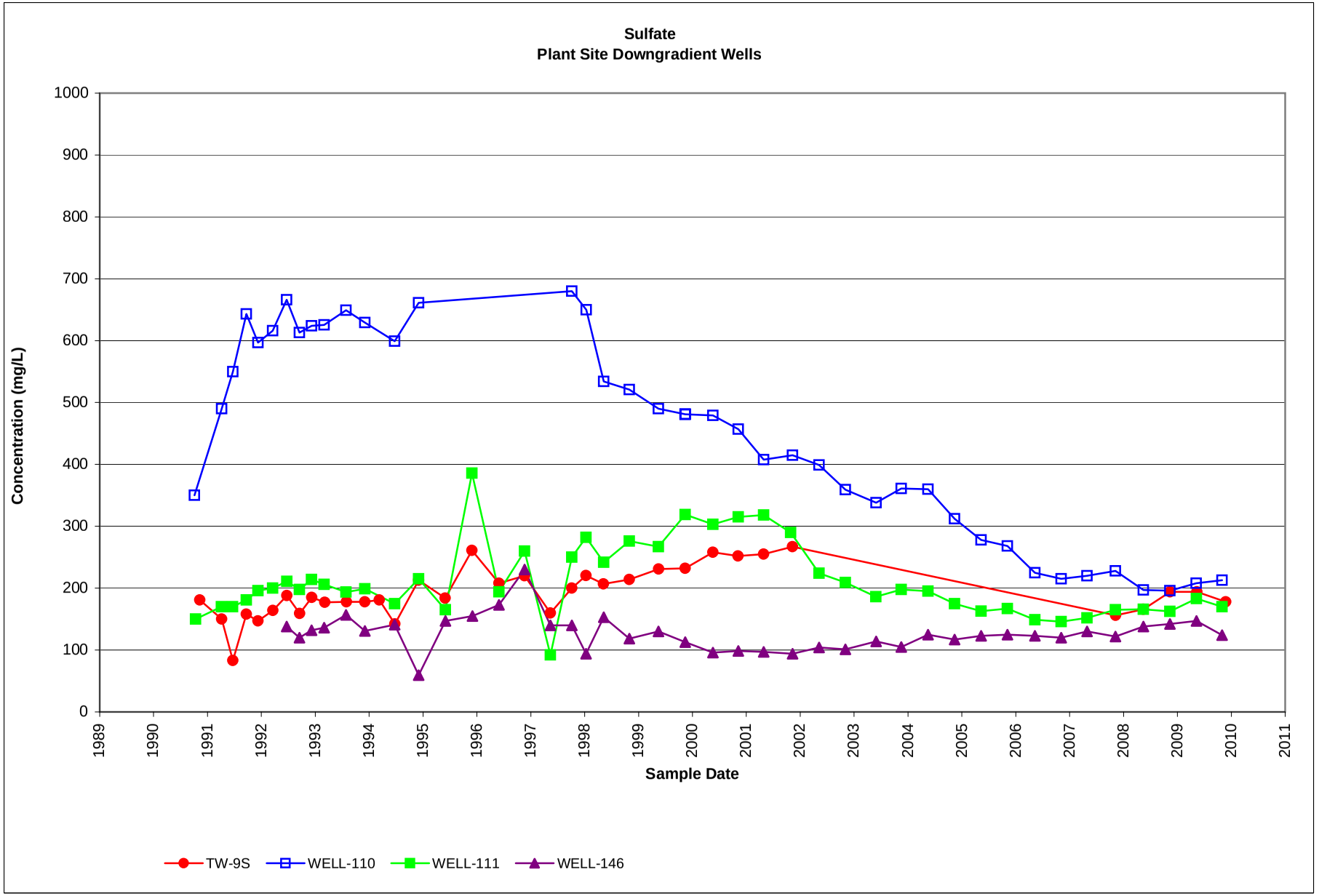

Total Phosphorus / Orthophosphate
On-Plant / Joint Fenceline Area Wells
Note logarithmic y-axis scale used to accommodate
large range of observed concentrations.
Concentration (mg/L)
1000
100
10
1
0.1
0.01
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
WELL-134
WELL-139
WELL-145
WELL-159

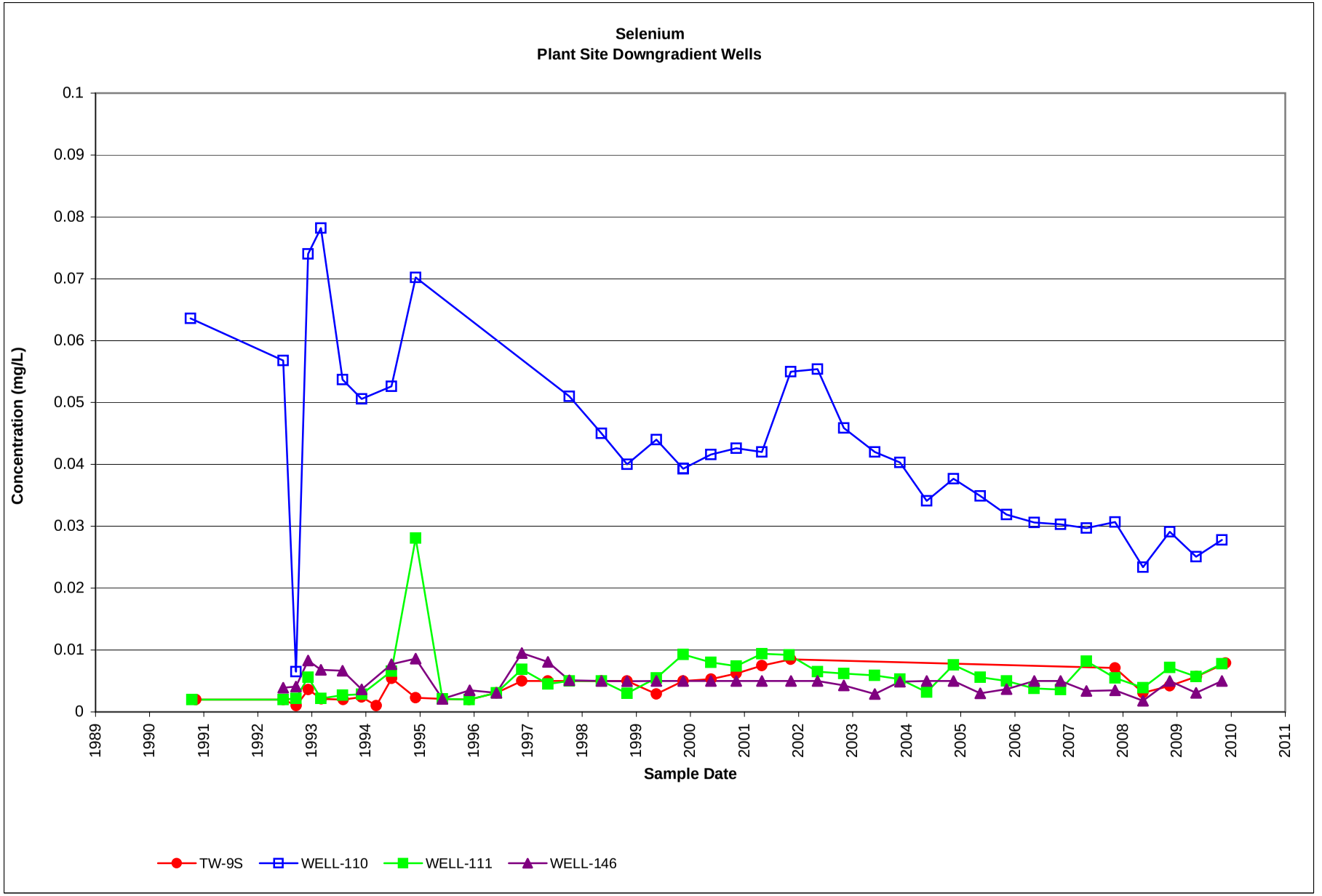
PLANT SITE DOWNGRADIENT WELLS

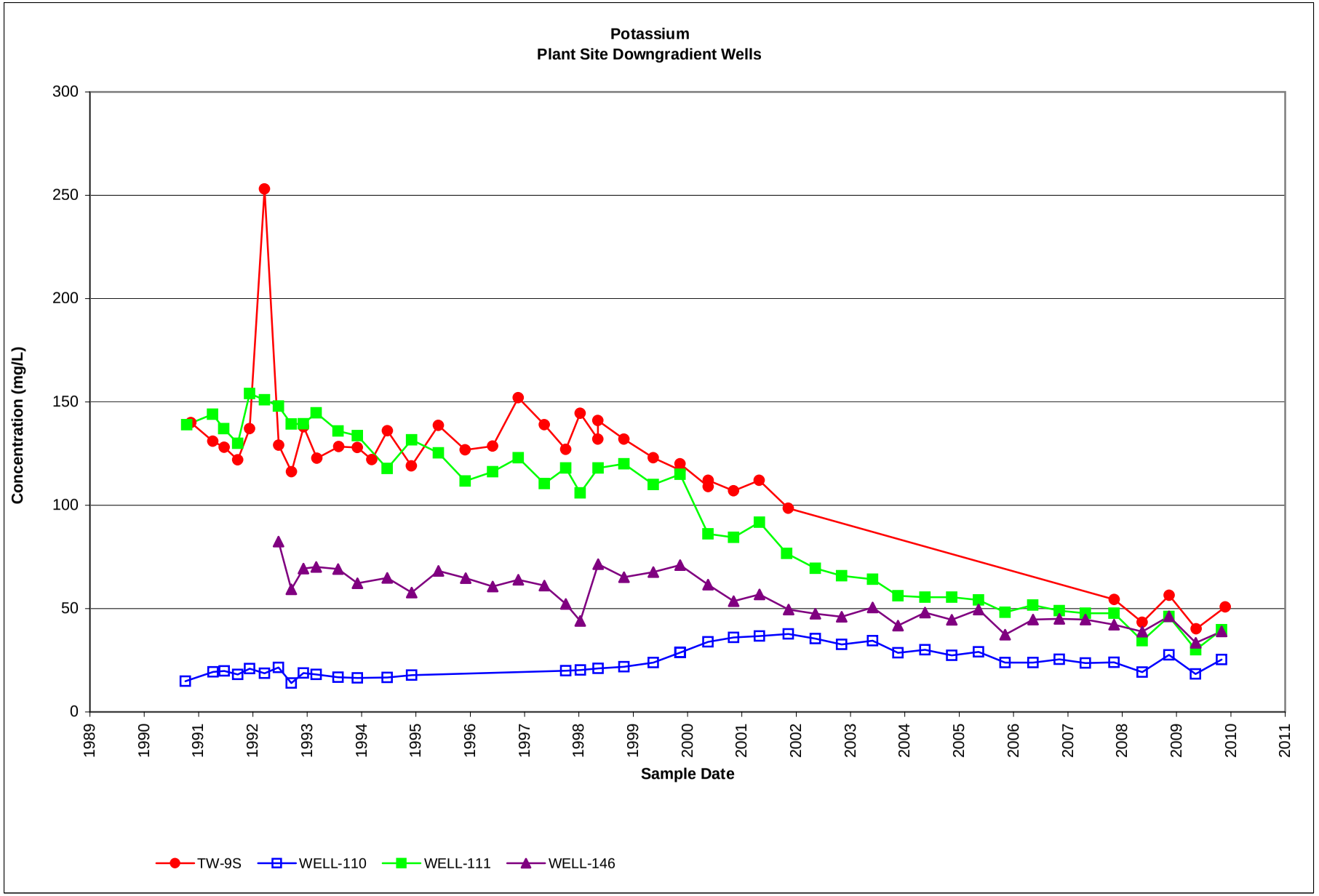

pH
Plant Site Downgradient Wells
pH (standard units)
9
8.5
8
7.5
7
6.5
6
5.5
5
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
TW-9S
WELL-110
WELL-111
WELL-146

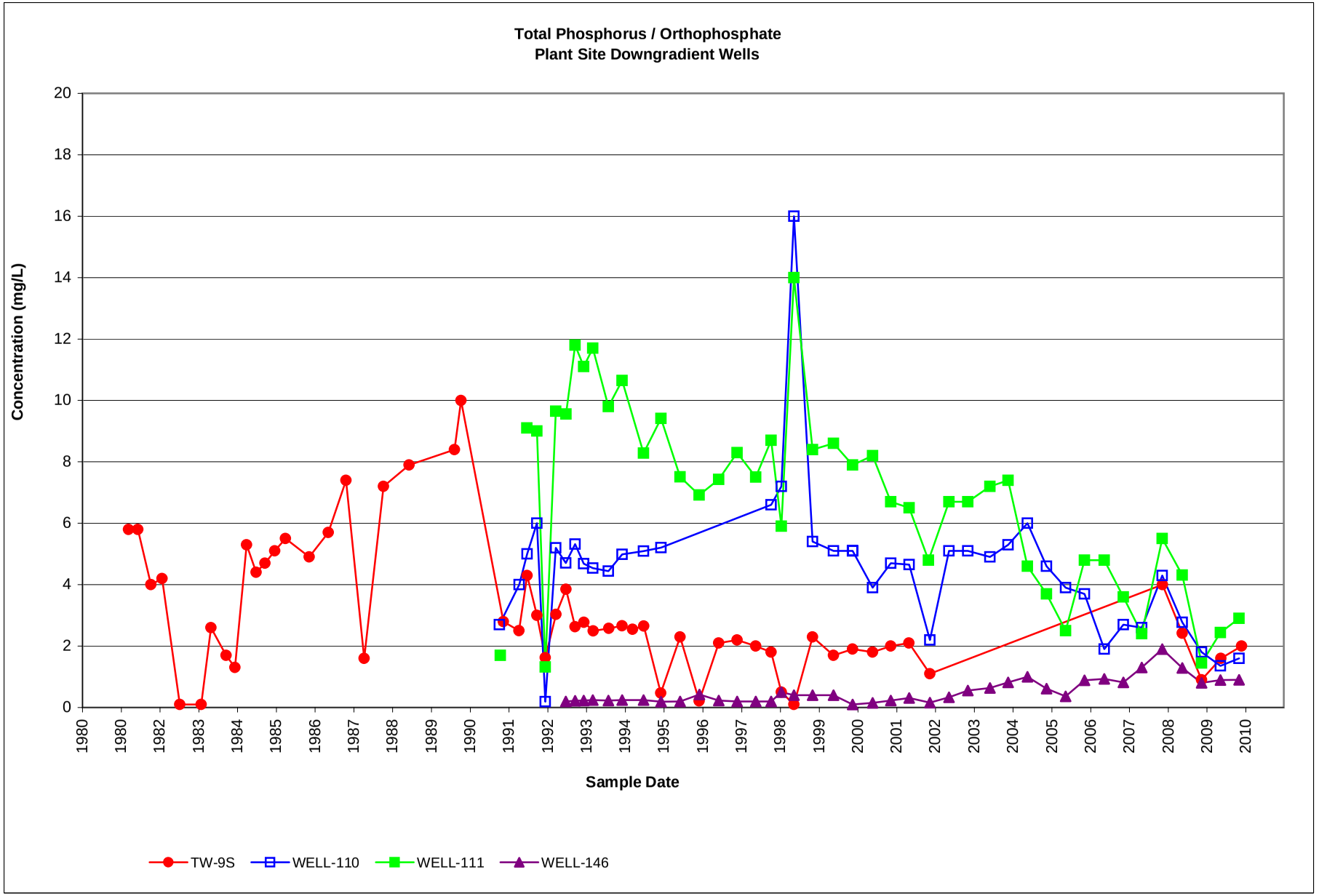

Specific Conductance
Plant Site Downgradient Wells
SC (umhos/cm)
3500
3000
2500
2000
1500
1000
500
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
TW-9S
WELL-110
WELL-111
WELL-146


Arsenic
Plant Site Downgradient Wells
Concentration (mg/L)
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
TW-9S
WELL-110
WELL-111
WELL-146

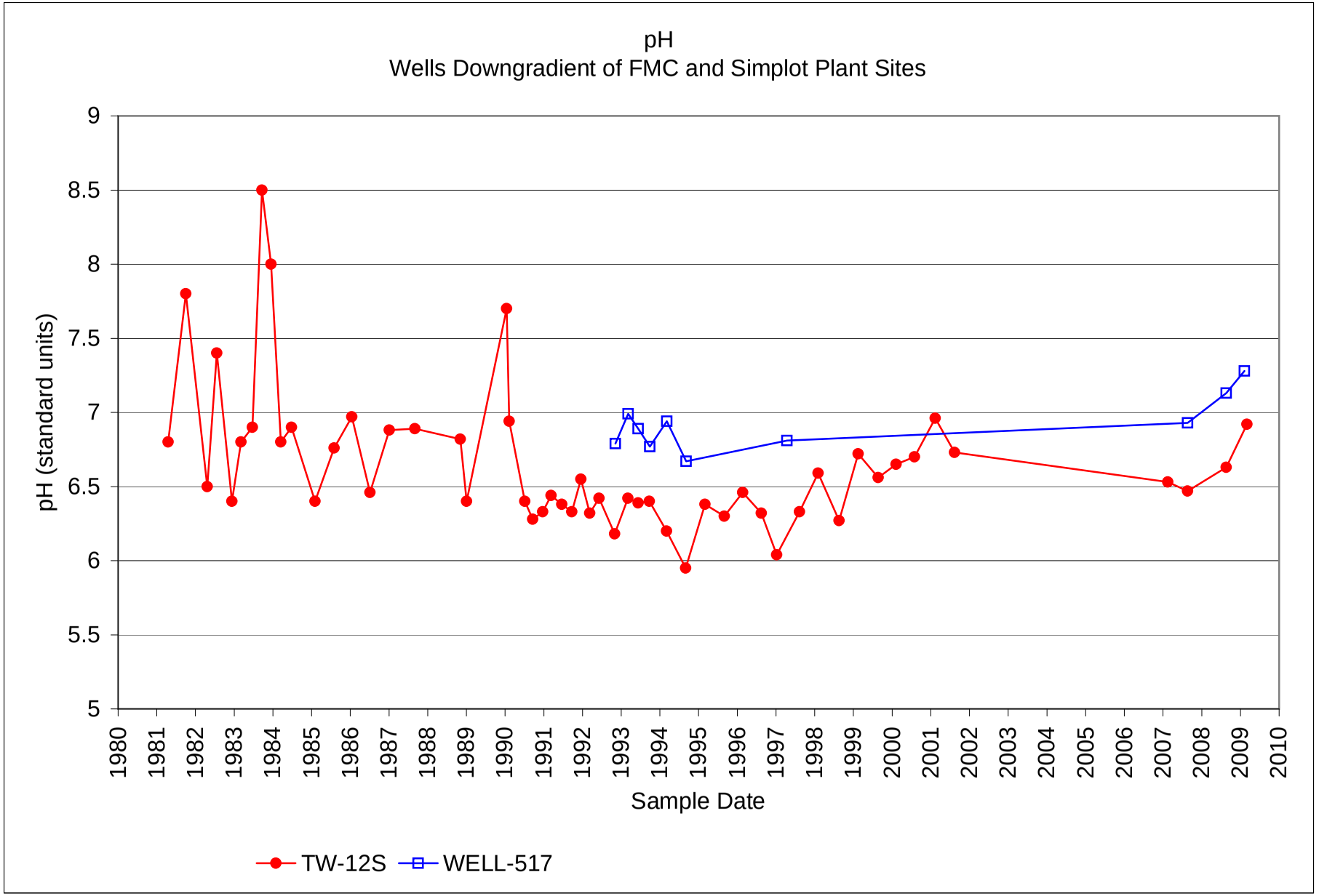

Sulfate
Plant Site Downgradient Wells
Concentration (mg/L)
1000
900
800
700
600
500
400
300
200
100
0
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Sample Date
TW-9S
WELL-110
WELL-111
WELL-146

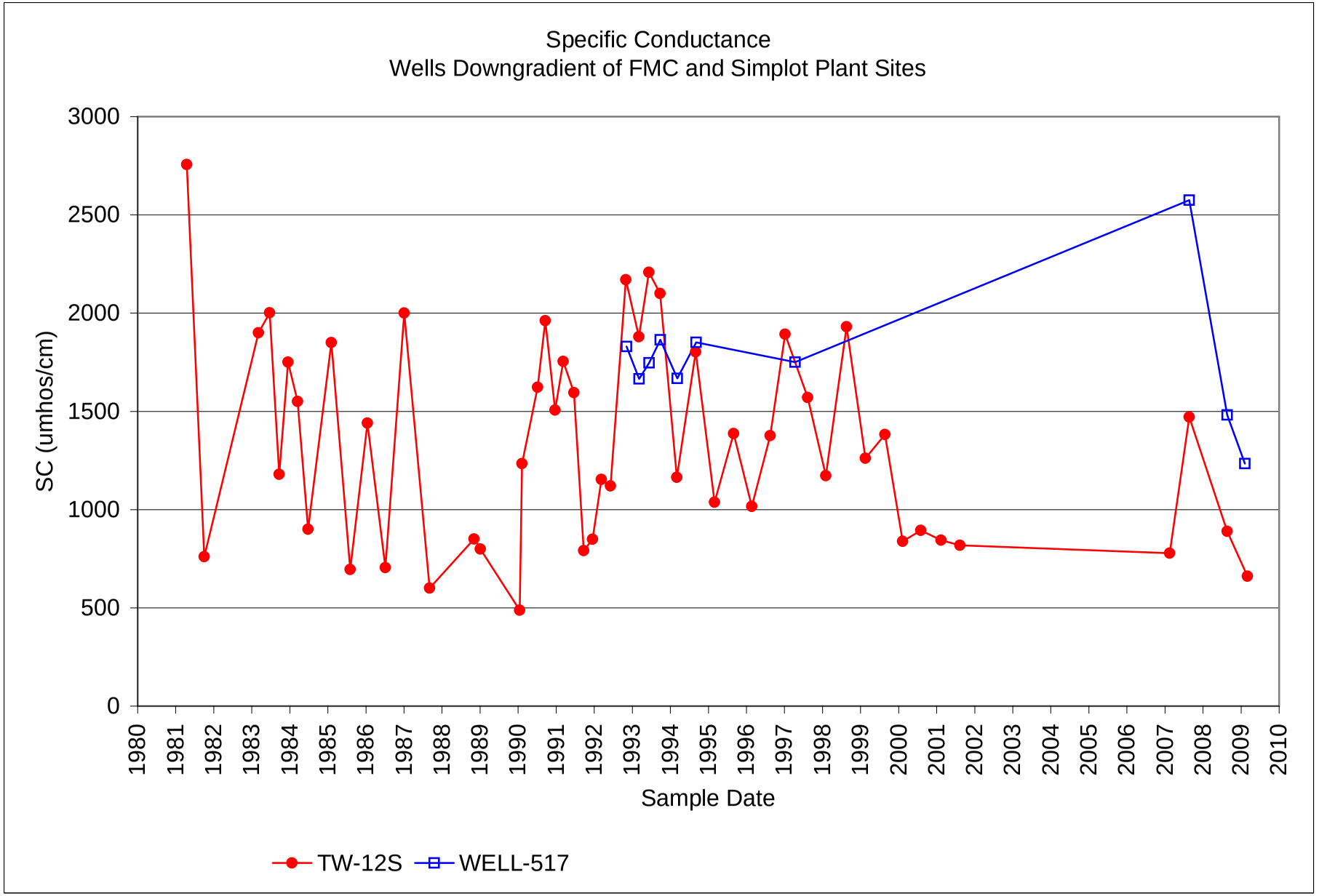

Selenium
Plant Site Downgradient Wells
Concentration (mg/L)
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Sample Date
TW-9S
WELL-110
WELL-111
WELL-146

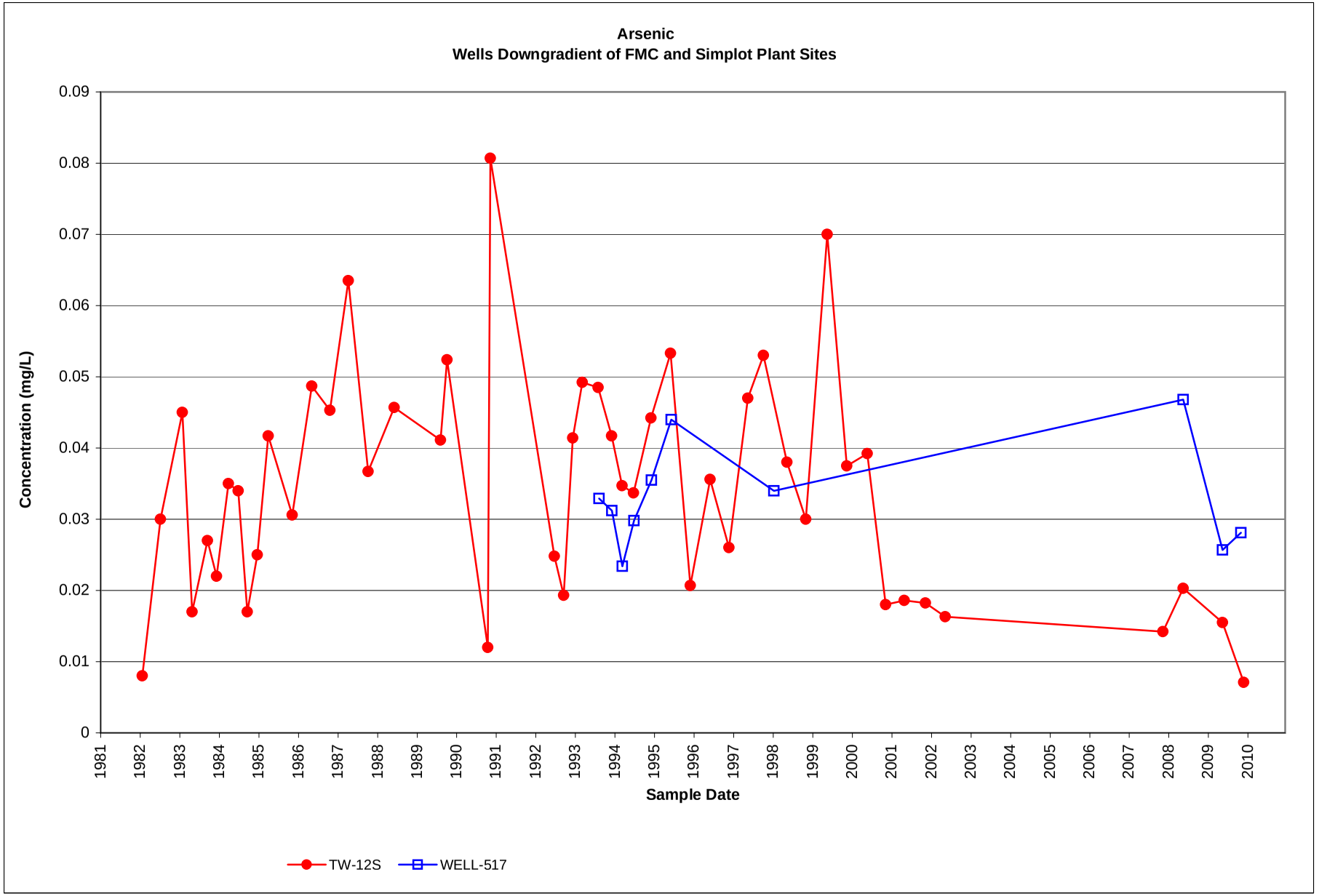

Potassium
Plant Site Downgradient Wells
Concentration (mg/L)
300
250
200
150
100
50
0
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Sample Date
TW-9S
WELL-110
WELL-111
WELL-146

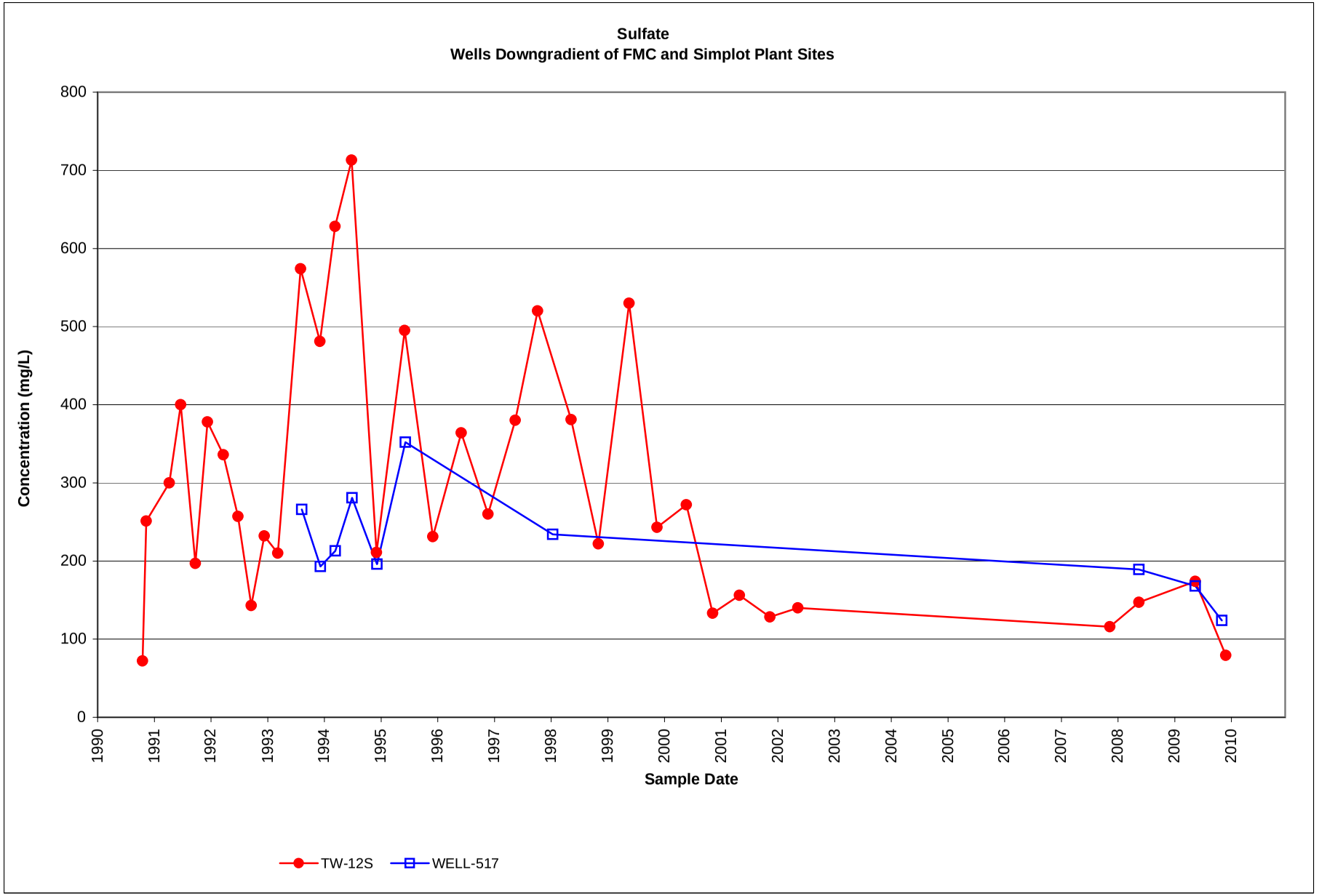

Total Phosphorus / Orthophosphate
Plant Site Downgradient Wells
Concentration (mg/L)
0
2
4
6
8
10
12
14
16
18
20
1980
1980
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
TW-9S
WELL-110
WELL-111
WELL-146

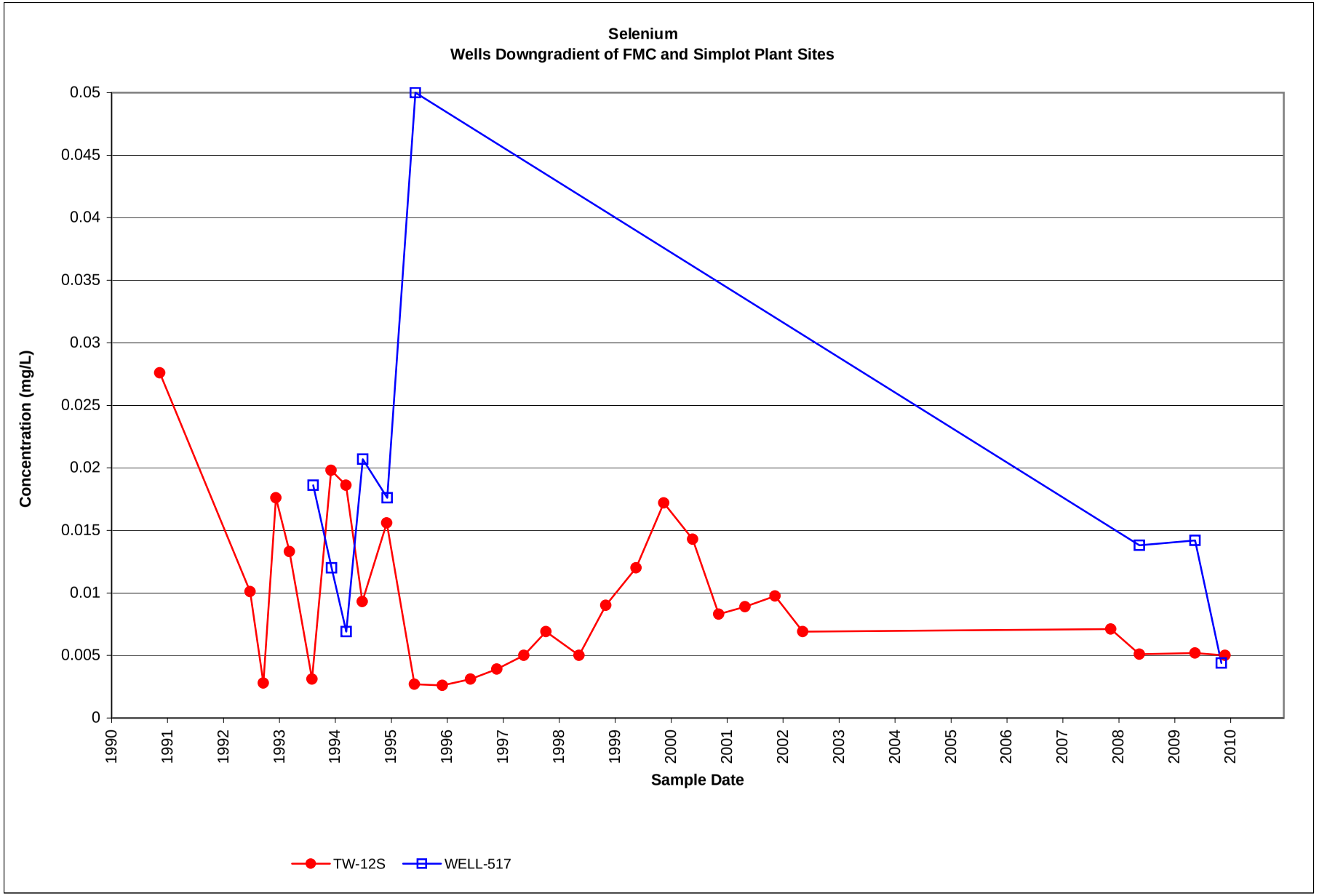
WELLS DOWNGRADIENT OF FMC AND SIMPLOT PLANT SITES

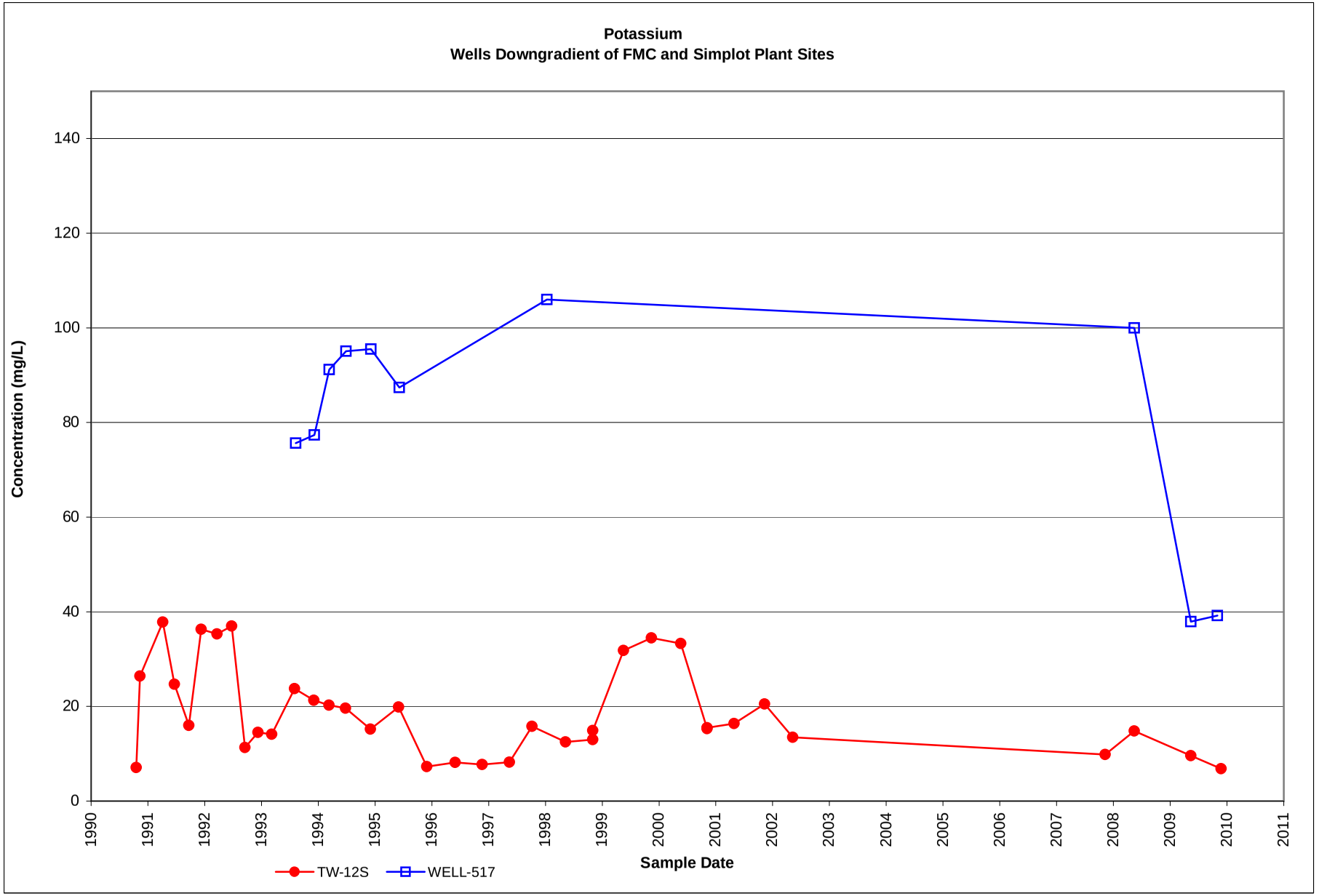

pH
Wells Downgradient of FMC and Simplot Plant Sites
pH (standard units)
9
8.5
8
7.5
7
6.5
6
5.5
5
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
TW-12S
WELL-517

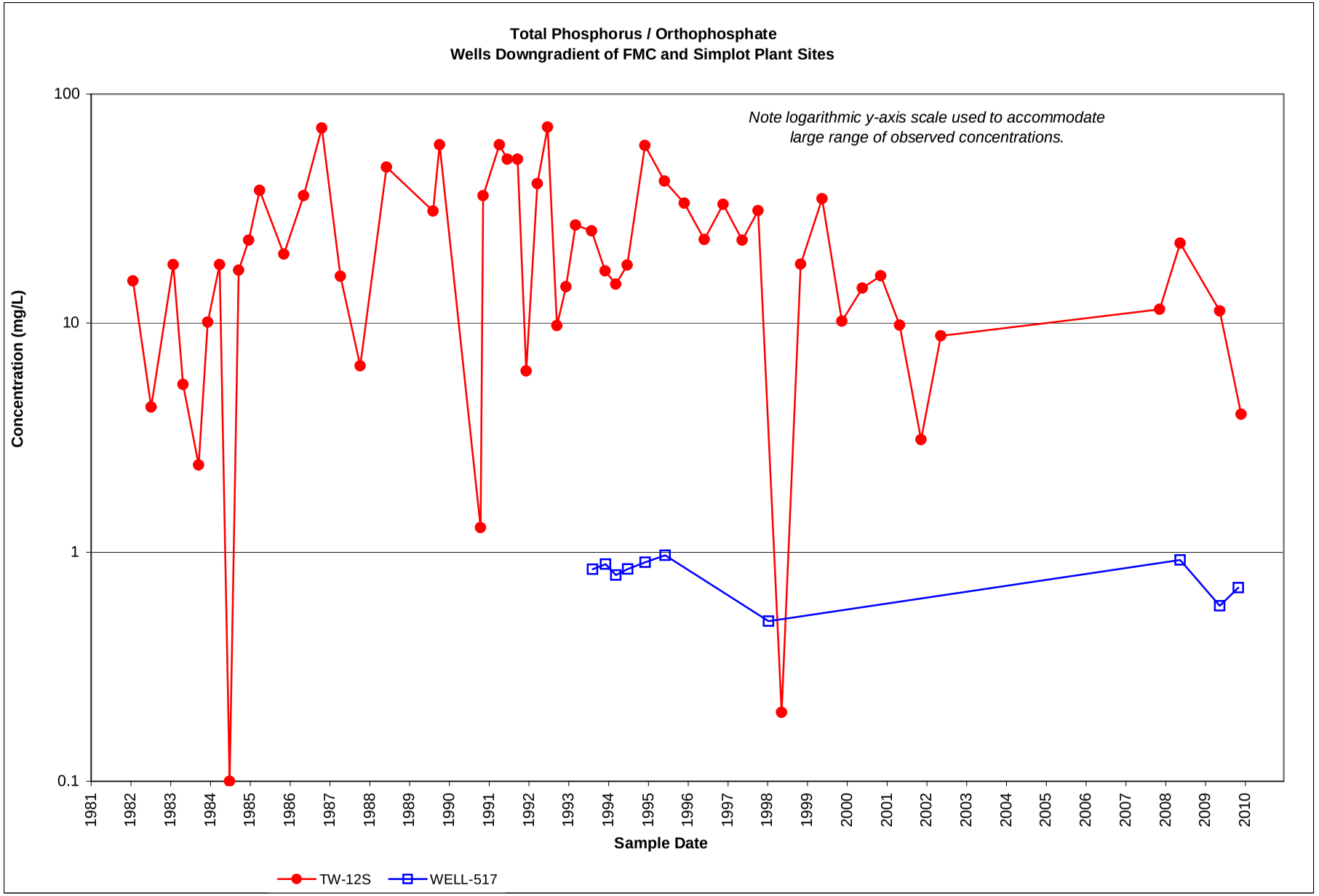

Specific Conductance
Wells Downgradient of FMC and Simplot Plant Sites
SC (umhos/cm)
3000
2500
2000
1500
1000
500
0
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
TW-12S
WELL-517


Arsenic
Wells Downgradient of FMC and Simplot Plant Sites
Concentration (mg/L)
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
TW-12S
WELL-517

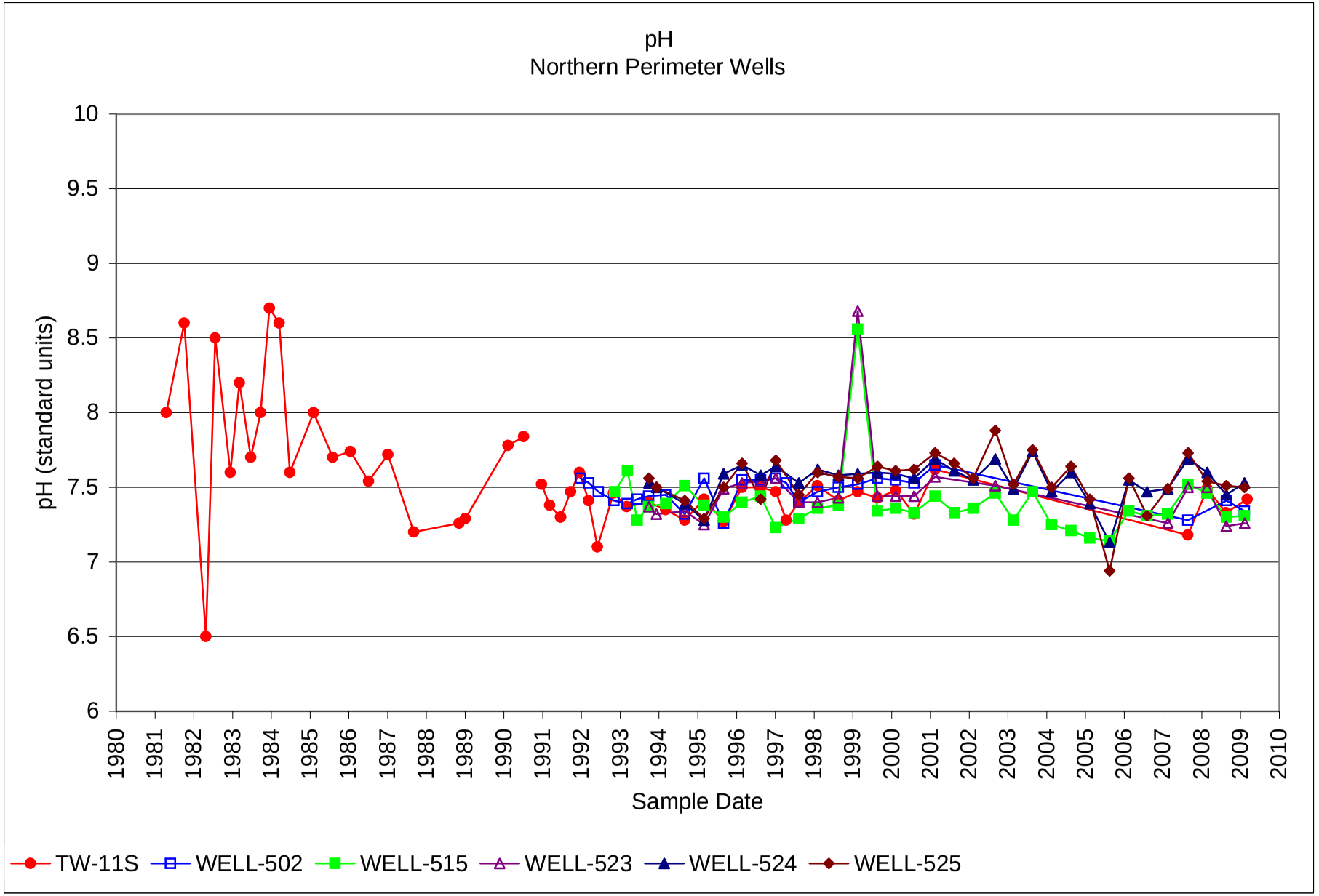

Sulfate
Wells Downgradient of FMC and Simplot Plant Sites
Concentration (mg/L)
800
700
600
500
400
300
200
100
0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
TW-12S
WELL-517

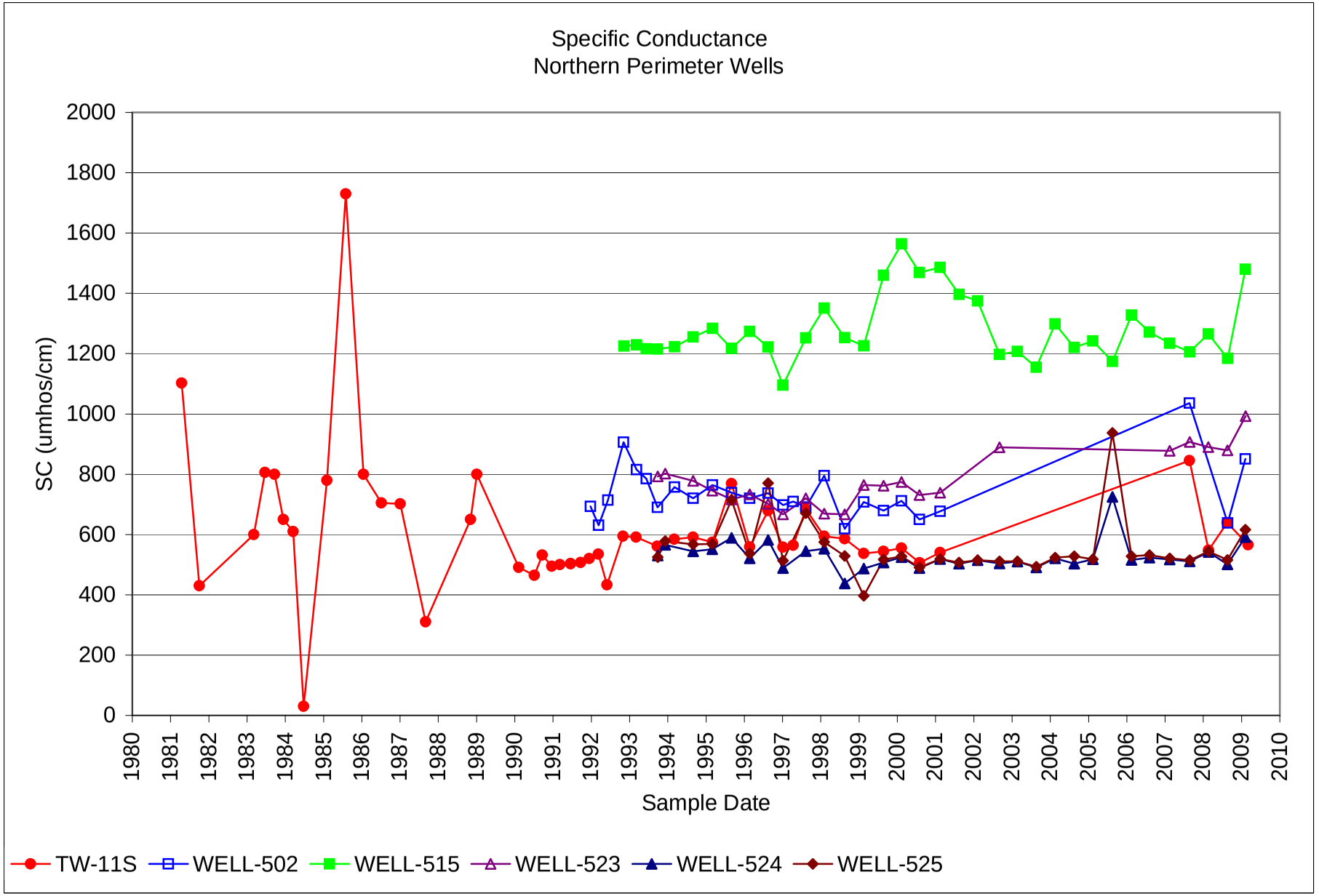

Selenium
Wells Downgradient of FMC and Simplot Plant Sites
Concentration (mg/L)
0.05
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
TW-12S
WELL-517

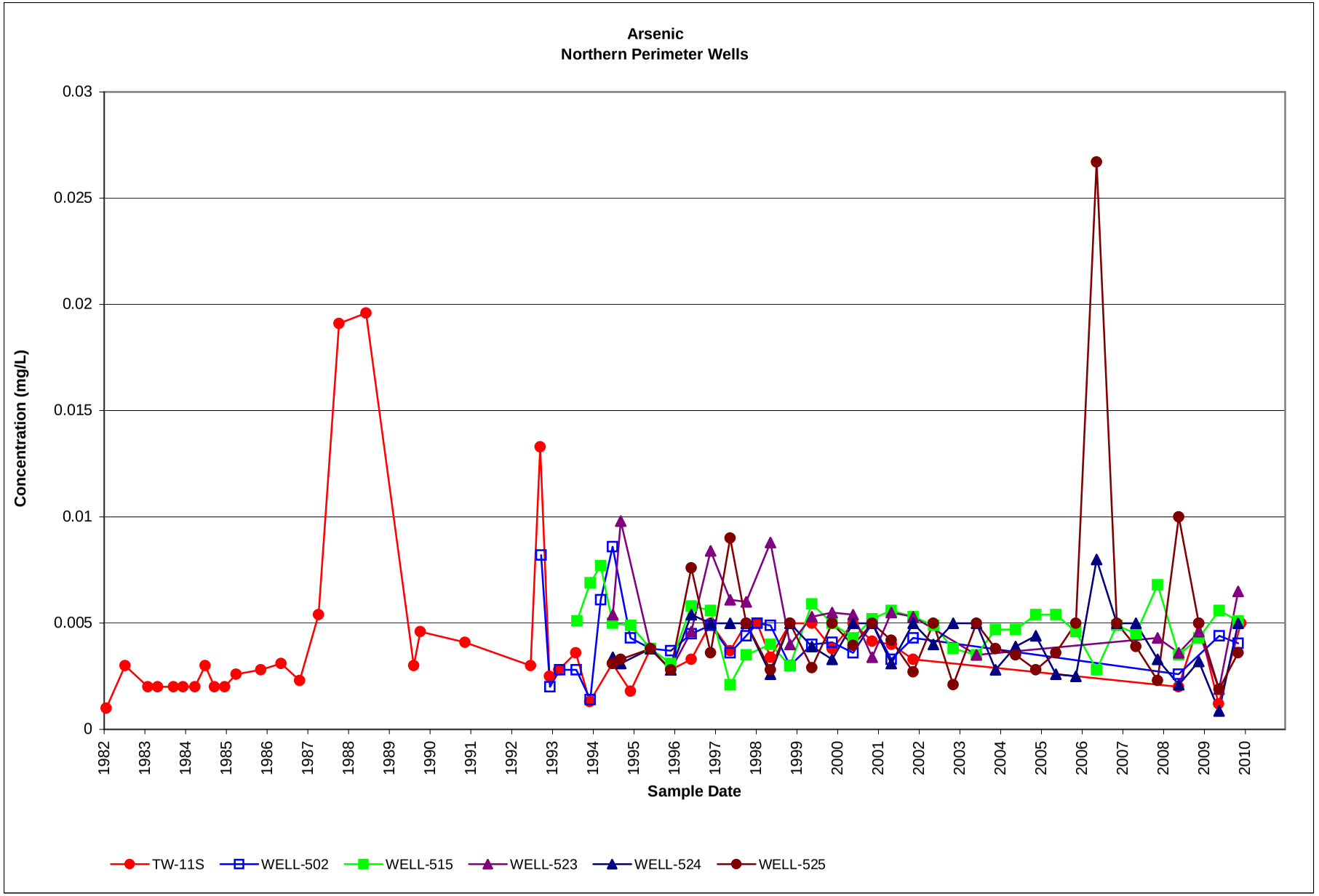

Potassium
Wells Downgradient of FMC and Simplot Plant Sites
Concentration (mg/L)
0
20
40
60
80
100
120
140
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Sample Date
TW-12S
WELL-517

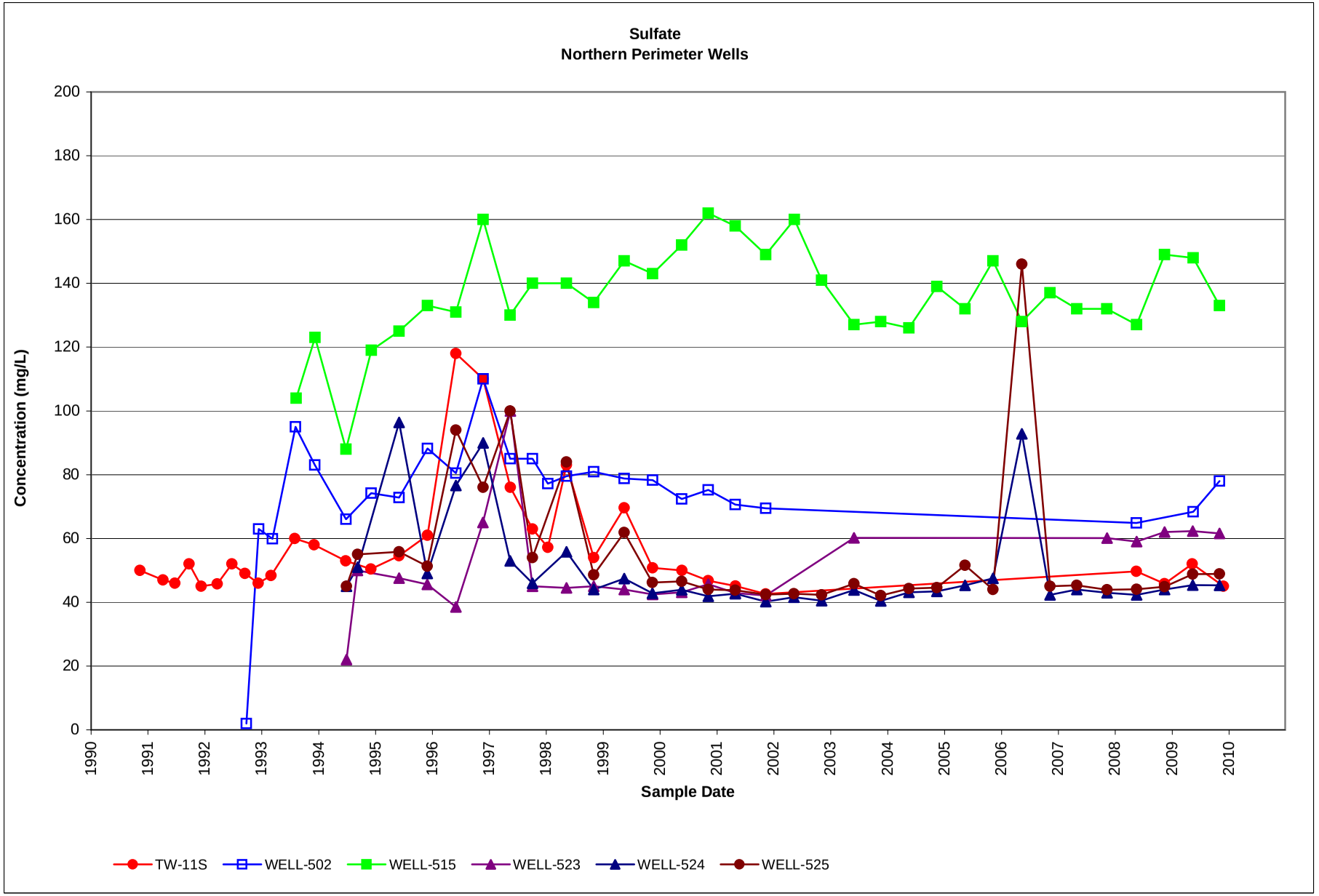

Total Phosphorus / Orthophosphate
Wells Downgradient of FMC and Simplot Plant Sites
Note logarithmic y-axis scale used to accommodate large range of observed concentrations.
Concentration (mg/L)
100
10
1
0.1
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
TW-12S
WELL-517

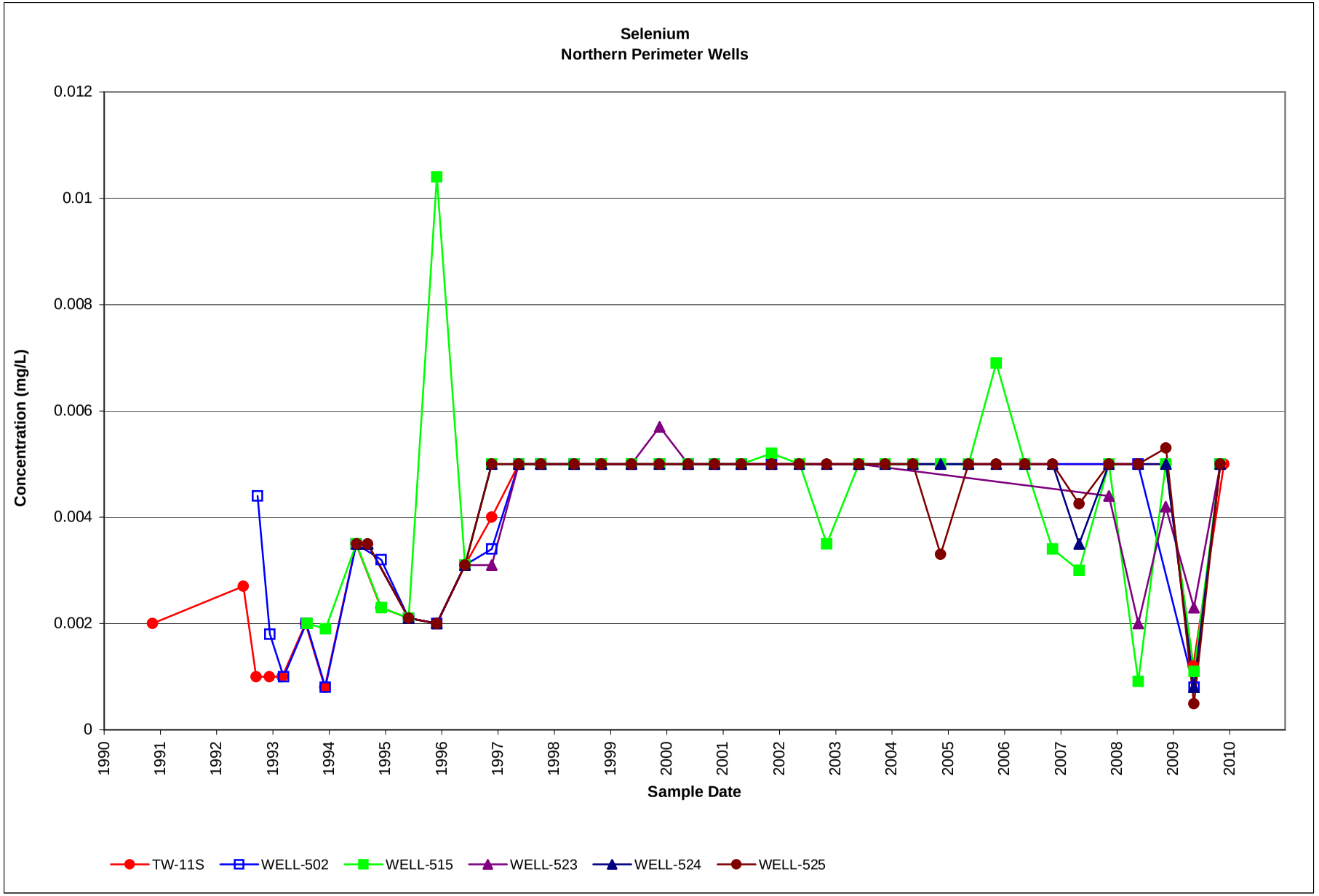
NORTHERN PERIMETER WELLS

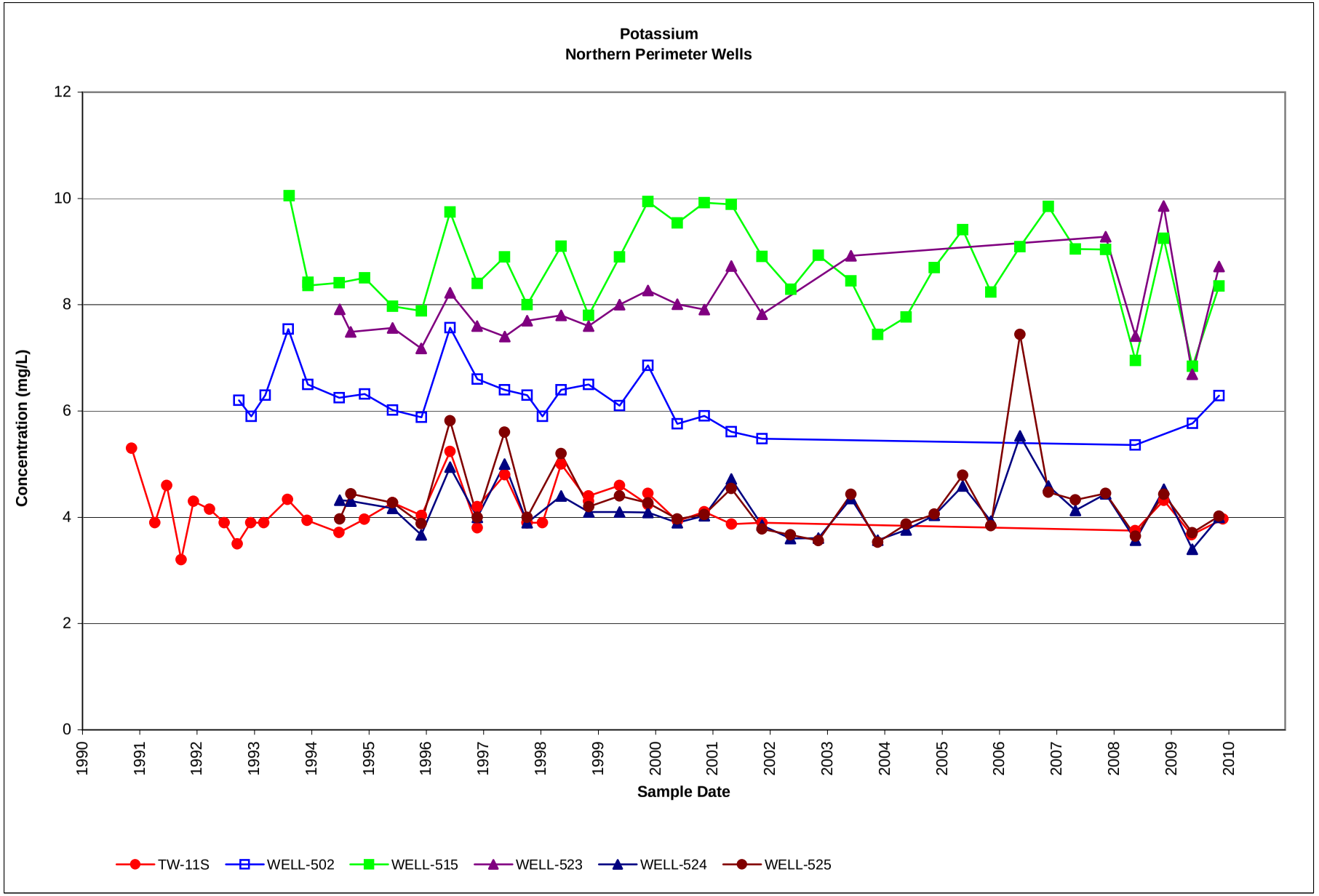

pH
Northern Perimeter Wells
pH (standard units)
10
9.5
9
8.5
8
7.5
7
6.5
6
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
TW-11S
WELL-502
WELL-515
WELL-523
WELL-524
WELL-525

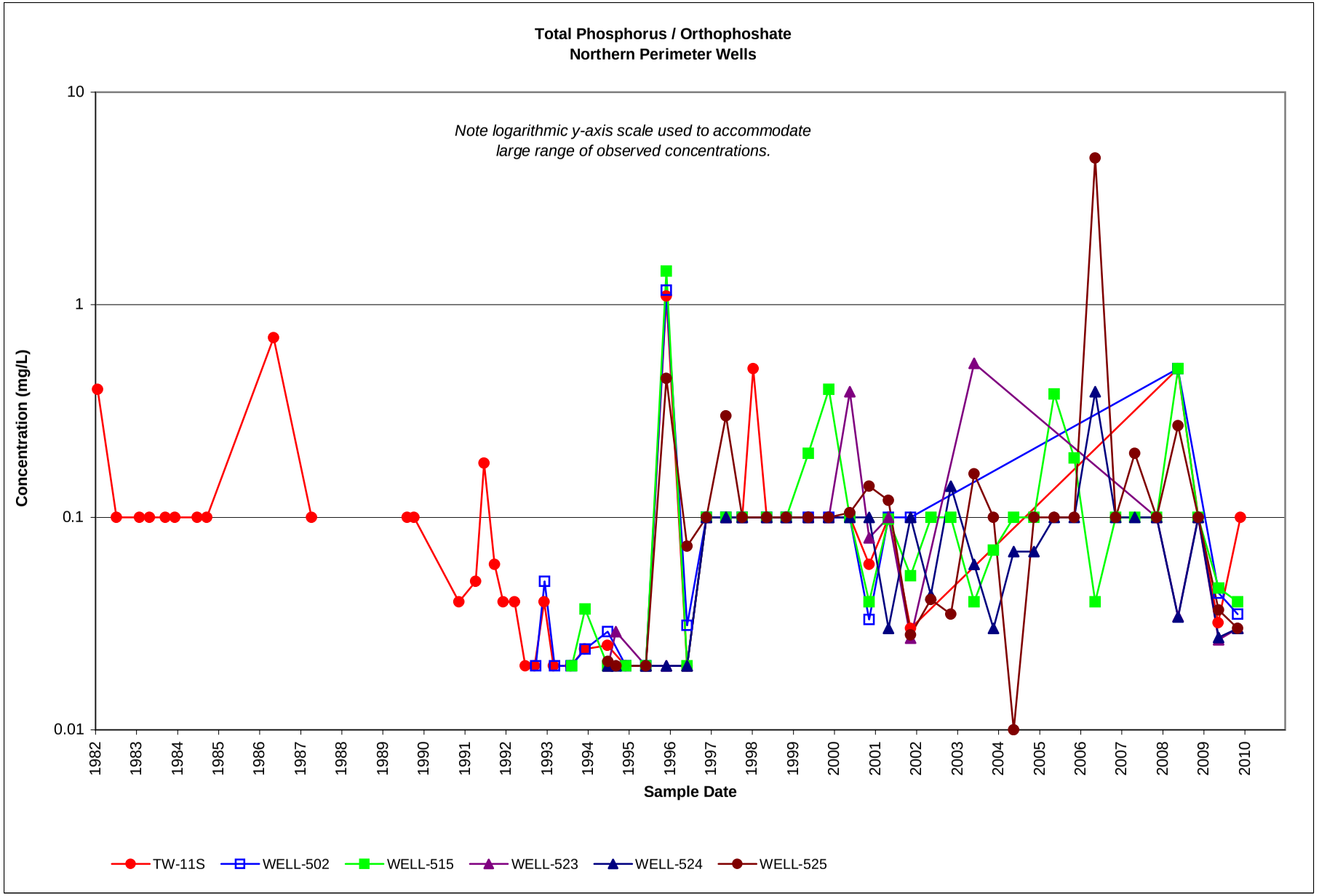

Specific Conductance
Northern Perimeter Wells
SC (umhos/cm)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
TW-11S
WELL-502
WELL-515
WELL-523
WELL-524
WELL-525


Arsenic
Northern Perimeter Wells
Concentration (mg/L)
0.03
0.025
0.02
0.015
0.01
0.005
0
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
TW-11S
WELL-502
WELL-515
WELL-523
WELL-524
WELL-525


Sulfate
Northern Perimeter Wells
Concentration (mg/L)
200
180
160
140
120
100
80
60
40
20
0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
TW-11S
WELL-502
WELL-515
WELL-523
WELL-524
WELL-525


Selenium
Northern Perimeter Wells
Concentration (mg/L)
0.012
0.01
0.008
0.006
0.004
0.002
0
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
TW-11S
WELL-502
WELL-515
WELL-523
WELL-524
WELL-525


Potassium
Northern Perimeter Wells
Concentration (mg/L)
0
2
4
6
8
10
12
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
TW-11S
WELL-502
WELL-515
WELL-523
WELL-524
WELL-525


Total Phosphorus / Orthophoshate
Northern Perimeter Wells
Note logarithmic y-axis scale used to accommodate large range of observed concentrations.
Concentration (mg/L)
10
1
0.1
0.01
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Sample Date
TW-11S
WELL-502
WELL-515
WELL-523
WELL-524
WELL-525

APPENDIX D

SUMMARY OF RESULTS FOR THE FMC 2Q2009 GROUNDWATER MONITORING EVENT FMC IDAHO LLC, POCATELLO, IDAHO

FMC Groundwater Monitoring Programs
Summary of the Results for the 2Q2009 Groundwater Monitoring Event
July 30, 2009

On April 21, 2009, FMC submitted a plan for proposed modifications to its routine CERCLA groundwater monitoring plan and a special deep well monitoring event ("FMC CERCLA Groundwater Monitoring Program, Modification to the Routine CERCLA Well Network and 2Q2009 Special Deep Well Monitoring Event, April 21, 2009"). In summary, FMC's April 21, 2009 plan included the following elements in addition to FMC's routine groundwater monitoring programs:

1. Beginning with the 2Q2009 monitoring round, FMC added six existing monitoring wells to its routine CERCLA groundwater monitoring well network, specifically wells 134, 145, 159, 502, 517 and TW12S.

2. FMC performed a special monitoring event for 2Q2009 to sample and analyze deep (and paired shallow) wells in order to re-validate historical results.

EPA approved FMC's April 21, 2009 plan and proposed 2Q2009 CERCLA special sampling and analysis event by letter dated May 5, 2009. The special shallow/deep well pair groundwater monitoring event was conducted concurrently with the routine second quarter 2009 (2Q2009) RCRA, Calciner Ponds and FMC voluntary CERCLA groundwater monitoring programs during the period May 11 through 20, 2009. An EPA representative observed FMC's groundwater monitoring program at the site on May 11 through 13, 2009. This summary presents the results of FMC's 2Q2009 groundwater monitoring event.

2Q2009 Groundwater Monitoring Program

Groundwater Level Monitoring

Consistent with FMC's CERCLA, RCRA and Calciner Pond groundwater monitoring programs, FMC performs quarterly groundwater level (elevation) measurements at numerous monitoring wells that provide uniform coverage across the entire FMC Plant OU. During the 2Q2009 event, water level measurements were taken at the following list of wells:

- Wells 101 to 191 inclusive (i.e., includes all shallow and deep wells within the FMC "100-series" wells);

- TW-5S, TW-5I, TW-5D, TW-9S, TW-11S and TW-12S; and,

- 501, 502, 503, 505, 514, 515, 516, 517, 518, 523, 524 and 525.

Monitoring Well Networks

As described in FMC's April 21, 2009 plan, FMC added six existing monitoring wells to its routine CERCLA groundwater monitoring well network, specifically wells 134, 145, 159, 502, 517 and TW12S. The CERCLA, RCRA and Calciner Pond groundwater monitoring well networks, as of April 2009, that were sampled for field and laboratory analyses during the 2Q2009 event are presented on Table 1 and shown on Figure 1.

2Q2009 Special Deep Well Network

The shallow/deep paired wells that were sampled and analyzed during the 2Q2009 special deep well event are enumerated in Table 2 and shown on Figure 2.

Field and Laboratory Analytical Parameters

Consistent with FMC's routine groundwater monitoring programs, the analytical parameters for the 2Q2009 event included:

Routine Analytical Parameters:			
Field parameters:	General Mineral:	Metals:	Additional Parameters:
Dissolved Oxygen	Ammonia	Potassium	Elemental phosphorus [4]
pH	Chloride	Arsenic	
Temperature	Fluoride	Selenium	
Turbidity	Nitrate	Cadmium [3]	
Specific conductance	Orthophosphate [1]		
	Total phosphorus [2]		
ORP	Sulfate		

Notes:

[1] Per the RCRA groundwater monitoring plans, analysis of the RCRA wells is for orthophosphate (and not for total phosphorus except per Note [2]).

[2] Per the RCRA groundwater monitoring plan, the Slag Pit Sump wells (108, 121, 122 and 123) are also analyzed for total phosphorus in addition to orthophosphate. Per the Calciner Pond Remedial Action Groundwater Monitoring Plan (2008), the Calciner Pond well network is analyzed for total phosphorus (and not orthophosphate). The CERCLA well network is analyzed for total phosphorus (and not orthophosphate).

[3] Per the RCRA groundwater monitoring plans, analysis of the RCRA wells includes cadmium. Cadmium is not analyzed for the Calciner Pond and CERCLA well networks.

[4] Semi-annual sampling and analysis of elemental phosphorus only at the Pond 8S wells (155, 156, 157, 158 and 183) and the Slag Pit Sump wells (108, 121, 122 and 123). Well 107 was analyzed for elemental phosphorus during the 2Q2009 special event only.

Pursuant to the April 21, 2009 plan, the 2Q2009 special shallow / deep well pair samples were analyzed for the same parameters as the CERCLA monitoring well network. In addition, deep well 107 was analyzed for elemental phosphorus during the 2Q2009 special event.

Summary of Results of the 2Q2009 Monitoring Programs

Water Level Monitoring

As described in the Groundwater Current Conditions Report for the FMC Plant OU (GWCCR), the groundwater system at the site is stable and groundwater elevations and gradient have not changed significantly in the over 18 years of quarterly water level monitoring. Groundwater elevations measured in the shallow groundwater wells during the 2Q2009 event are consistent with prior monitoring as shown on Figure 3.

Vertical head differentials were measured in well pairs during the 2Q2009 event. Vertical head differentials are one measure of the flow potential between shallow and deeper saturated zones. (The other factor is the vertical hydraulic conductivity). The vertical head differentials also provide indications of the direction of the flow or gradient between shallow and deeper zones.

As described in the GWCCR, the overall pattern of vertical differentials shows that in the area along the flanks of the Bannock Range there is a downward flow potential. Well pairs 130/137 and 101/102 typically exhibited slight (0.02 to 0.33 foot) downward gradients, and well pair 103/104 typically exhibited a slight (0.04 to 0.11 foot) upward gradient. This pattern was also observed based on May 2009 water levels at well pairs 101/102 and 103/104, while well pair 130/137 exhibited a slight (0.15 foot) upward gradient during this monitoring event. Water levels measured in May 2009 for site-wide shallow/deep well pairs are shown on Table 3. Further north, vertical gradients are consistently upward in well pairs 134/133, 107/108, and TW-5S/TW-5D as was again observed based on May 2009 water level measurements.

During the EMF RI, there was a downward gradient measured in well pair 125/126, located near production well FMC-1, which drew water from the deeper aquifer and may have induced a local downward gradient. However, based on measurements in May 2009, the slight (less than 0.1 foot) downward gradient at well pair 125/126 does not relate to pumping of FMC's production well FMC-1 that has not been used in over 9 years.

From the area along the joint facilities' fenceline out to the Portneuf River, there are upward vertical head differentials with deeper wells typically 2 to 6 feet higher than water levels in the shallow wells. The May 2009 water level measurements at well pair 109/110 showed the water level in the deeper well (109) was 5.3 feet higher than the shallow well (110), consistent with the EMF RI findings in this area of the site. The May 2009 water level measurements at well pair 503/519 showed the water level in the deeper well (519) was 1.6 feet higher than the shallow well (503), consistent

with the EMF RI findings in this area of the site. The water levels in well pair 144/145 showed no significant vertical gradient during the May 2009 monitoring.

The slight downward gradient at the 524/525 well pair is not inconsistent with groundwater discharge to the Portneuf River through springs and as baseflow. In contrast with other well pairs to the south, a very slight (.04-.07 foot differential) downward vertical gradient exists at the 524/525 well pair (as measured during the EMF RI and May 2009), which is just north of the groundwater discharge areas at Batiste Spring, Swanson Road Spring and the Portneuf River. Adjacent wells 524 (deep) and 525 (shallow) are screened at depths of 48.5-58.5 and 17.8-27.8 feet below ground, respectively, within silty gravel deposits. No confining beds are present. The slight vertical gradient at well 524/525 indicates that horizontal flow is dominant within the shallow gravel interval penetrated by both wells.

Results for Routine Monitoring Well Networks

The field and analytical laboratory results for the routine monitoring program wells are presented on Table 4. The results for the routine CERCLA, Calciner Pond and RCRA monitoring well networks were consistent with those from recent monitoring events reported in the Groundwater Current Conditions Report for the FMC Plant OU, June 2009 Final. The results for wells 134, 145, 159, 502, 517 and TW-12S that have been added to the routine CERCLA monitoring program beginning with the 2Q2009 event are described below.

The results for wells 502, 517 and TW-12S were comparable to those from the 2Q2008 special monitoring event. The results for the 2Q2008 event are detailed in the GWCCR. Consistent with past results, none of the 2Q2009 results for well 502 exceeded the respective representative levels. Although generally lower than the 2Q2008 results, the 2Q2009 results for wells 517 and TW-12S remained above representative levels for arsenic, potassium (517 only), sulfate, nitrate and total phosphorus. Consistent with the 2Q2008 result, the 2Q2009 result for selenium also exceeded the representative level in well 517.

The results for wells 134 and 159, located downgradient from former Pond 8S and the western ponds area, were generally consistent with prior results. However, the 2Q2009 results for several constituents were noticeably higher than the most recent results for these wells. Time series graphs of arsenic, potassium and total phosphorus / orthophosphate concentrations at wells 134 and 159 are provided on Figures 4, 5 and 6. The 2Q2009 potassium and arsenic results for well 134 were higher than the 2Q2008 results and returned to levels consistent with 2001 (potassium) and 1993-1994 (arsenic). Similarly, the 2Q2009 potassium, total phosphorus and arsenic results for well 159 were higher than the most recent results (November 2001). The total phosphorus and arsenic results for well 159 returned to levels similar to 1993-1994, but the potassium concentration was significantly higher than previous results.

Despite the apparently increased concentrations observed at wells 134 and 159, the potassium, total phosphorus and arsenic concentrations remain consistent with these wells' locations downgradient from former Pond 8S. The 2Q2009 arsenic, potassium and total phosphorus / orthophosphate results for wells 155, 156 and 157, located immediately downgradient from former Pond 8S, are shown on Figures 4, 5 and 6. The 2Q2009 potassium concentrations of 128 and 232 mg/l at wells 159 and 134, respectively, are still significantly lower than 2Q2009 results from wells 155, 156 and 157 of 587, 1410, and 398 mg/l, respectively. Similarly, the 2Q2009 total phosphorus concentrations of 219 and 29.9 mg/l at wells 159 and 134, respectively, are still significantly lower than 2Q2009 results from wells 156 and 157 of 261 and 330 mg/l, respectively. The 2Q2009 arsenic results for wells 159 and 134 are comparable to the result for well 156. Continued routine monitoring of wells 134 and 159 will aid in evaluating whether the increased concentrations observed in May 2009 compared to the most recent results represents a short term or longer term trend downgradient from former Pond 8S and the western ponds area.

The results for well 145, located in the joint feneceline area, were generally consistent with prior results although the 2Q2009 arsenic results were higher than the 2Q2008 results and were similar to the arsenic concentration at well 136, located further to the east in the joint fenceline area.

Results for the Special Deep Well Sampling Event

The field and analytical laboratory results for the special event shallow / deep well pairs are presented on Table 5. As described above, the results for the shallow wells paired with deep wells were consistent with those from recent monitoring events that were reported in the Groundwater Current Conditions Report for the FMC Plant OU, June 2009 Final. The results for the deep wells are described in greater detail below.

As summarized above for the results of water level monitoring, slight downward or essentially neutral vertical gradients are observed along the flanks of the Bannock Range and in the transition area to the Michaud Flats. As described in the EMF RI Report and the GWCCR, elevated arsenic and common ion concentrations were also present in the deeper aquifer in this area (wells within the Bannock Range to Michaud Flats transition area). Typically, elevated arsenic and common ion concentrations in the deeper aquifer are localized and are much lower than those detected in the shallow aquifer as shown on Table 5. The May 2009 results for deep wells 103,130, 133 and 144 are consistent with the EMF RI results as shown on Table 6 and summarized as follows:

- Potassium, total phosphorus and arsenic exceeded the representative levels in Well 103;
- Arsenic exceeded the representative level in well 130;
- Specific conductance, potassium and sulfate exceeded the representative levels in well 133; and,

- Specific conductance, potassium, chloride and sulfate exceeded the representative levels in well 144.

As expected based on the lack of site-related impacts at shallow well 126, the paired deep well 125 did not exceed any representative levels.

In the northern portion of the FMC Plant Site, where upward vertical gradients become more pronounced, the deep groundwater zone shows little to no impact. Sulfate slightly exceeded the representative level at well 107 but none of the other analytical parameters exceeded representative levels. Elemental phosphorus was not detected in well 107 at a detection limit of 0.05 ug/l. The temperature at well 107 is elevated above background due to the former thermal loading from the slag tapping operations, but has decreased as predicted based on the observed decreasing temperature at paired shallow well 108. The sulfate result for well TW-5D slightly exceeded the representative level but none of the other parameters exceeded their representative levels. None of the results for well 109 exceeded their respective representative levels.

Overall, the results of the 2Q2009 special deep well monitoring event confirmed the findings of the EMF RI that impacts to the deep groundwater zone are much lower than observed in the shallow zone and are limited to the area of the site where downward or essentially neutral vertical hydraulic gradients exist in the transition from the Bannock Range to the Michaud Flats. The results from the deep wells located near the FMC Plant Site northern property (wells TW-5D and 109) confirm the EMF RI finding that FMC impacted groundwater is not migrating beyond the Plant Site in the deep groundwater zone.

TABLE 1. FMC'S ROUTINE GROUNDWATER MONITORING PROGRAM WELL NETWORKS (As of 2Q2009 Monitoring Event)

Area	Well Numbers [1]	Up / Downgradient	Program [2]
Pond 18 Cell A	174	U	RCRA
	154, 177, 178	D	RCRA
Pond 17	173	U	RCRA
	171, 172, 180	D	RCRA
Pond 16S	154	U	RCRA
	147,148, 149	D	RCRA
Pond 15S	165	U	RCRA
	113, 115, 166	D	RCRA
Phase IV ponds	167	U	RCRA
	104, 114, 131, 168	D	RCRA
Pond 9E	124, 113	U	RCRA
	126, 127, 128	D	RCRA
Pond 8E	167	U	RCRA
	104, 114, 131, 168	D	RCRA
Pond 8S	158, 183	U	RCRA
	155, 156, 157	D	RCRA
Slag Pit Sump	121	U	RCRA
	108, 122, 123	D	RCRA
Batiste Spring	Batiste Spring	D	RCRA
Calciner Ponds	164, 161, 142	U	IDEQ
	136, 143, 189, 190	D	IDEQ
Within FMC plant	139, **134**, **145, 159**	D	CERCLA
Northern edge FMC plant	111, 146, 110, 523	D	CERCLA
Downgradient from FMC plant toward Batiste Spring	TW-9S, **517**, **502**, **TW-12S**	D	
Outside EMF impact [3] - northern perimeter	515, TW-11S, 524, 525	Cross	CERCLA

[1] Wells in blue-colored BOLD font were added to the routine CERCLA well network beginning with the 2Q2009 monitoring event per FMC April 21, 2009 proposal and EPA May 5, 2009 approval of the proposed 2Q2009 special monitoring event.
[2] Program: RCRA = RCRA groundwater monitoring plans, IDEQ = Calciner Pond groundwater monitoring plan, CERCLA = CERCLA "interim monitoring plan" well network.
[3] Impact is in reference to detection of arsenic, nitrate or selenium above representative levels.

TABLE 2. FMC SHALLOW AND DEEP WELL PAIRS THAT WERE INCLUDED FOR THE 2Q2009 "SPECIAL" GROUNDWATER MONITORING EVENT

Shallow	Deep
104	103
108	107
110	109
126	125
137 [a]	130
134	133
145	144
TW-5S [a]	TW-5D

[a] Shallow wells not included in the routine groundwater monitoring programs that were sampled in conjunction with the identified paired deep well during the 2Q2009 special event.

TABLE 3. Vertical Head Differentials in Shallow/Deep Well Pairs, May 2009

SITE NUMBER	TIME 5/11/09	SWL (ft)	TOC Elev (ft)	SWL Elev (ft)	Aquifer Zone	Difference (ft)
101	7:33	74.89	4,472.10	4,397.21	Shallow	0.11
102	7:34	74.60	4,471.70	4,397.10	Deep	(0.11)
130	8:36	73.43	4,470.60	4,397.17	Deep	0.15
137	8:39	74.08	4,471.10	4,397.02	Shallow	(0.15)
103	7:56	89.33	4,486.40	4,397.07	Deep	0.25
104	7:58	89.88	4,486.70	4,396.82	Shallow	(0.25)
125	8:57	59.27	4,455.80	4,396.53	Deep	(0.05)
126	8:56	59.42	4,456.00	4,396.58	Shallow	0.05
133	8:12	84.28	4,479.50	4,395.22	Deep	0.14
134	8:13	83.82	4,478.90	4,395.08	Shallow	(0.14)
107	9:43	87.92	4,482.50	4,394.58	Deep	1.53
108	9:45	89.35	4,482.40	4,393.05	Shallow	(1.53)
144	9:51	85.84	4,478.30	4,392.46	Deep	0.01
145	9:53	85.85	4,478.30	4,392.45	Shallow	(0.01)
TW-5D	9:37	80.89	4,475.00	4,394.11	Deep	0.65
TW-5I	9:40	80.88	4,475.07	4,394.19	Intermediate	0.73
TW-5S	9:39	81.69	4,475.15	4,393.46	Shallow	(0.73)
109	10:31	61.08	4,451.30	4,390.22	Deep	5.26
110	10:33	65.64	4,450.60	4,384.96	Shallow	(5.26)
519	11:28	13.90	4,399.70	4,385.80	Deep	1.64
503	11:27	16.04	4,400.20	4,384.16	Shallow	(1.64)
524	11:59	16.71	4,399.90	4,383.19	Deep	(0.07)
525	12:01	16.34	4,399.60	4,383.26	Shallow	0.07

TABLE 4. Results from FMC's 2Q2009 Routine Calciner Pond, CERCLA and RCRA Groundwater Monitoring Program Wells

Parameter **Routine Analytes**	WELL-104	WELL-108	WELL-110	WELL-111	WELL-113	WELL-114	WELL-115	WELL-121
Field Measurements								
DEPTH TO WATER LEVEL (FEET)	89.88	89.35	65.64	75.07	71.2	73.94	73.19	91.07
FLOW (CFS)								
PH (FLD)	7.34	7.07	6.95	7.04	7.13	7.11	7.17	6.98
SC (UMHOS/CM AT 25 C) (FLD)	2257	2443	1370	1300	1185	1608	2325	2577
OXIDATION REDUCTION POTENTIAL								
OXYGEN (O) (FLD) DIS	0.14	3.93	1.81	0.53	1.18	0.19	0.21	3.06
TURBIDITY (NTU) (FLD)	0.6	0.5	0.5	0.5	0.6	0.5	0.3	0.4
WATER TEMPERATURE (C) (FLD)	14.6	18.8	16.9	15.1	12	11.3	11.6	16.6
General WQP								
POTASSIUM (K) TOT	251 J	110 J	18.4 NE,J	30.1 NE,J	17.7 J	22.5 J	11.1 J	60.6 J
POTASSIUM (K) DIS								
SULFATE (SO4)	163	231	208	183	99.2	116	188	263
CHLORIDE (CL)	168	377	106 ,J	189 ,J	151	157	167	438
FLUORIDE (F)	3.8	0.4	0.4	< 0.1	0.5	0.9	0.2	0.1
TOTAL AMMONIA (NH3+NH4 AS N)	2.9	< 0.2	< 0.2	< 0.2	0.1 ,J	1.4	< 0.2	< 0.2
NITRATE (NO3-N)	25.9	15.8	4.2	9	8.9	< 0.1	32.1	24.1
ELEMENTAL PHOSPHORUS		0.028						< 0.00005
TOTAL PHOSPHORUS		1 ,J						0.5 ,J
PHOSPHORUS TOT (6020)			1.36 E	2.44 E				
PHOSPHORUS DIS (6020)								
ORTHOPHOSPHATE (PO4-P)	2.2 ,J	2.1 ,J			< 0.1 ,J	2.7 ,J	3.4 ,J	< 0.1 ,J
Metals								
ARSENIC (AS) TOTAL	0.0403	0.0167	0.0369	0.0194	0.0245	0.111	0.235	0.0089
ARSENIC (AS) DIS								
CADMIUM (CD) TOTAL	< 0.001	< 0.001			< 0.001	< 0.001	< 0.001	< 0.001
CADMIUM (CD) DIS								
SELENIUM (SE) TOTAL	0.0064 ,U	0.0108 ,U	0.0251	0.0057	< 0.005	< 0.005	0.0047 ,U,J	0.0122 ,U
SELENIUM (SE) DIS								

TABLE 4. Results from FMC's 2Q2009 Routine Calciner Pond, CERCLA and RCRA Groundwater Monitoring Program Wells

Parameter **Routine Analytes**	WELL-122	WELL-123	WELL-124	WELL-124 DUP	WELL-126	WELL-127	WELL-128
Field Measurements							
DEPTH TO WATER LEVEL (FEET)	82.53	90.98	51.59		59.42	61.71	65.35
FLOW (CFS)							
PH (FLD)	6.77	6.77	7.38		7.54	7.33	7.25
SC (UMHOS/CM AT 25 C) (FLD)	3017	2354	1193		878	1807	1885
OXIDATION REDUCTION POTENTIAL							
OXYGEN (O) (FLD) DIS	0.28	0.22	4.03		4.34	3.2	3.71
TURBIDITY (NTU) (FLD)	0.9	0.4	0.3		0.3	0.3	0.3
WATER TEMPERATURE (C) (FLD)	17.6	18.2	14.3		16.4	14.4	12.5
General WQP							
POTASSIUM (K) TOT	146 J	24.2 J	13.6	14.2	10.6	15.1	18.5
POTASSIUM (K) DIS							
SULFATE (SO4)	348	429	91.8 ,J	93.4 ,J	89.8 ,J	174 ,J	154 ,J
CHLORIDE (CL)	406	208	202	174	98.2	328	378
FLUORIDE (F)	0.1	0.7	0.7	0.7	0.9	0.5	0.4
TOTAL AMMONIA (NH3+NH4 AS N)	< 0.2	2.9	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
NITRATE (NO3-N)	26.3	9.1	2.8	2.8	2	5.1	5.9
ELEMENTAL PHOSPHORUS	0.00071	0.00022					
TOTAL PHOSPHORUS	9.1 ,J	0.8 ,J					
PHOSPHORUS TOT (6020)							
PHOSPHORUS DIS (6020)							
ORTHOPHOSPHATE (PO4-P)	9.6 ,J	< 0.1 ,J	< 0.1 ,J	< 0.1 ,J	< 0.1 ,J	< 0.1 ,J	< 0.1 ,J
Metals							
ARSENIC (AS) TOTAL	0.0557	0.205	0.0104	0.0111	0.009	0.0083	0.0154
ARSENIC (AS) DIS							
CADMIUM (CD) TOTAL	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
CADMIUM (CD) DIS							
SELENIUM (SE) TOTAL	0.0092 ,U	0.143	< 0.005	< 0.005	0.0041 ,U,J	0.0075 ,U	< 0.005
SELENIUM (SE) DIS							

TABLE 4. Results from FMC's 2Q2009 Routine Calciner Pond, CERCLA and RCRA Groundwater Monitoring Program Wells

Parameter **Routine Analytes**	WELL-131	WELL-134	WELL-134 DUP	WELL-136	WELL-139	WELL-142	WELL-143
Field Measurements							
DEPTH TO WATER LEVEL (FEET)	89.52	83.82		86.73	71.42	144.03	102.53
FLOW (CFS)							
PH (FLD)	7.21	6.75		6.01	6.96	6.4	6.47
SC (UMHOS/CM AT 25 C) (FLD)	1968	2803		5751	4647	3645	3233
OXIDATION REDUCTION POTENTIAL		150.5		101	264.6	95.6	111.6
OXYGEN (O) (FLD) DIS	0.2	0.11		0.12	1.3	1.49	0.29
TURBIDITY (NTU) (FLD)	22	0.7		1	0.7	1.3	2
WATER TEMPERATURE (C) (FLD)	13.9	16.9		15.6	13	16.1	14.6
General WQP							
POTASSIUM (K) TOT	14.4	232 NE,J	229 NE,J	53.4 E,J	37.3 NE,J	27.4 E,J	20.3 E,J
POTASSIUM (K) DIS	14.2						
SULFATE (SO4)	185	376	373	3040	1030	1280	677
CHLORIDE (CL)	218	394	364	166	911	161 ,J	595
FLUORIDE (F)	< 0.1	0.1	0.2	0.4	0.7	0.1	0.3
TOTAL AMMONIA (NH3+NH4 AS N)	< 0.2	1 ,U	0.8 ,U	2.5	0.1 ,U	< 0.2	1.8 ,U
NITRATE (NO3-N)	< 0.1	22.1	22.2	1.6	34.2	3	16.4
ELEMENTAL PHOSPHORUS							
TOTAL PHOSPHORUS							
PHOSPHORUS TOT (6020)		29.9 N,J	29.9 N,J	136 NE,J	0.202 BN,U,J	4.96 NE,J	1.52 NE,U,J
PHOSPHORUS DIS (6020)							
ORTHOPHOSPHATE (PO4-P)	5.2 ,J						
Metals							
ARSENIC (AS) TOTAL	0.0486	0.144	0.142	0.537 E	0.0122 B,J	0.0877 BE,J	0.108 E,J
ARSENIC (AS) DIS	0.0495						
CADMIUM (CD) TOTAL	< 0.001						
CADMIUM (CD) DIS	< 0.001						
SELENIUM (SE) TOTAL	< 0.005	0.009 BN,J	0.0094 BN,J	0.0425 B,J	0.0503 N,J	0.0143 B,U,J	0.0694
SELENIUM (SE) DIS	0.0043 ,U,J						

TABLE 4. Results from FMC's 2Q2009 Routine Calciner Pond, CERCLA and RCRA Groundwater Monitoring Program Wells

Parameter **Routine Analytes**	WELL-145	WELL-146	WELL-147	WELL-148	WELL-149	WELL-154	WELL-155
Field Measurements							
DEPTH TO WATER LEVEL (FEET)	85.85	69.26	46.53	49.42	50.21	49.58	94.65
FLOW (CFS)							
PH (FLD)	6.03	7.07	7.31	7.31	7.35	7.42	7.33
SC (UMHOS/CM AT 25 C) (FLD)	5610	1145	1039	1173	909	1180	3436
OXIDATION REDUCTION POTENTIAL	98.6						
OXYGEN (O) (FLD) DIS	0.07	2.97	3.85	2.81	4.85	4.99	0.17
TURBIDITY (NTU) (FLD)	3.6	0.5	0.4	0.5	0.5	0.5	0.5
WATER TEMPERATURE (C) (FLD)	15.5	16.9	16.9	16	15.9	16.8	14.7
General WQP							
POTASSIUM (K) TOT	64.6 E,J	33.4 NE,J	12.5	14.1	12	14.2	587 J
POTASSIUM (K) DIS							
SULFATE (SO4)	2960	147	66.6 ,J	107 ,J	57.1 ,J	50.1	250
CHLORIDE (CL)	175	155 ,J	185	202	148	195	171
FLUORIDE (F)	0.4	0.3	0.6	0.7	1	0.9	< 0.11
TOTAL AMMONIA (NH3+NH4 AS N)	3.9	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.2
NITRATE (NO3-N)	3.4	6.5	4	3.6	1.8	2.5	9.2
ELEMENTAL PHOSPHORUS							0.000029
TOTAL PHOSPHORUS							
PHOSPHORUS TOT (6020)	87.1 NE,J	0.896 E					
PHOSPHORUS DIS (6020)							
ORTHOPHOSPHATE (PO4-P)			< 0.1 ,J	< 0.1 ,J	0.6 ,J	< 0.1	35.4 ,J
Metals							
ARSENIC (AS) TOTAL	0.483 E	0.0254	0.0057 ,U	0.0083 ,U	0.0097	0.0048 ,J	0.129
ARSENIC (AS) DIS							
CADMIUM (CD) TOTAL			< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
CADMIUM (CD) DIS							
SELENIUM (SE) TOTAL	0.0825	0.0031 B,U,J	0.0078 ,U	0.0065 ,U	< 0.005	< 0.005	0.0067 ,U
SELENIUM (SE) DIS							

TABLE 4. Results from FMC's 2Q2009 Routine Calciner Pond, CERCLA and RCRA Groundwater Monitoring Program Wells

Parameter **Routine Analytes**	WELL-155 DUP	WELL-156	WELL-157	WELL-158	WELL-159	WELL-161	WELL-161 DUP
Field Measurements							
DEPTH TO WATER LEVEL (FEET)		97.99	105.95	98.88	95.79	108.65	
FLOW (CFS)							
PH (FLD)		7.14	6.88	6.99	6.67	6.39	
SC (UMHOS/CM AT 25 C) (FLD)		7351	3501	1432	3384	4432	
OXIDATION REDUCTION POTENTIAL					-87.5	129.2	
OXYGEN (O) (FLD) DIS		0.2	0.14	3.89	0.14	0.3	
TURBIDITY (NTU) (FLD)		1	0.5	0.6	1.4	0.6	
WATER TEMPERATURE (C) (FLD)		15.7	16.3	16.6	17.2	17.5	
General WQP							
POTASSIUM (K) TOT	529 J	1410 J	398 J	14.9 J	128 NE,J	26.7 E,J	22.3 E,J
POTASSIUM (K) DIS							
SULFATE (SO4)	252	232	226	311	238	2070	2040
CHLORIDE (CL)	172	410	256	95.3	247	156 ,J	173 ,J
FLUORIDE (F)	< 0.11	< 0.11	0.52	0.2	< 0.1	< 0.1	< 0.1
TOTAL AMMONIA (NH3+NH4 AS N)	0.2	9.8	2.2	< 0.2	5.5	< 0.2	< 0.2
NITRATE (NO3-N)	9	< 0.1	< 0.1	1.7	< 0.1	5.2	5.2
ELEMENTAL PHOSPHORUS	< 0.00005	< 0.00005	0.000026	< 0.00005			
TOTAL PHOSPHORUS							
PHOSPHORUS TOT (6020)					219 N,J	< 0.5 NE,J	< 0.25 NE,J
PHOSPHORUS DIS (6020)							
ORTHOPHOSPHATE (PO4-P)	35 ,J	261 ,J	330 ,J	< 0.1 ,J			
Metals							
ARSENIC (AS) TOTAL	0.132	0.147	0.0924	0.0103	0.162 ,J	< 0.1 E	< 0.05 E
ARSENIC (AS) DIS							
CADMIUM (CD) TOTAL	< 0.001	< 0.001	< 0.001	< 0.001			
CADMIUM (CD) DIS							
SELENIUM (SE) TOTAL	0.008 ,U	< 0.005	< 0.005	< 0.005	< 0.05 N,J	0.0074 B,U,J	0.0071 B,U,J
SELENIUM (SE) DIS							

TABLE 4. Results from FMC's 2Q2009 Routine Calciner Pond, CERCLA and RCRA Groundwater Monitoring Program Wells

Parameter **Routine Analytes**	WELL-164	WELL-165	WELL-166	WELL-167	WELL-168	WELL-171	WELL-172	WELL-173
Field Measurements								
DEPTH TO WATER LEVEL (FEET)	153.66	67.2	73.28	94.22	77.45	55.34	53.38	54.94
FLOW (CFS)								
PH (FLD)	6.12	7.24	7.05	7.1	7.09	7.37	7.3	7.6
SC (UMHOS/CM AT 25 C) (FLD)	5351	1402	1880	1463	1913	1257	1257	1107
OXIDATION REDUCTION POTENTIAL	108.3							
OXYGEN (O) (FLD) DIS	0.05	0.27	0.35	0.93	0.6	5.97	3.62	6.04
TURBIDITY (NTU) (FLD)	0.5	0.3	0.3	0.3	0.7	0.3	0.4	0.7
WATER TEMPERATURE (C) (FLD)	16.2	12.5	11.6	14.6	12.9	13.2	12.5	16.9
General WQP								
POTASSIUM (K) TOT	24.1 E,J	13.3	27.9 J	12 J	14.8	22	23.9	13.2
POTASSIUM (K) DIS								
SULFATE (SO4)	2570	178 ,J	168	159	608	93.1	85.1 ,J	61.3
CHLORIDE (CL)	164 ,J	245	214	154	80.8	234	180	184
FLUORIDE (F)	< 0.1	0.2	0.6	< 0.1	5.5	0.5	0.4	0.8
TOTAL AMMONIA (NH3+NH4 AS N)	< 0.2	< 0.2	< 0.2	0.1 ,J	0.2	0.1 ,J	< 0.2	< 0.2
NITRATE (NO3-N)	4.3	3.8	18.2	0.9	15.3	4.5	9.1	3.4
ELEMENTAL PHOSPHORUS								
TOTAL PHOSPHORUS								
PHOSPHORUS TOT (6020)	6.47 NE,J							
PHOSPHORUS DIS (6020)								
ORTHOPHOSPHATE (PO4-P)		< 0.1 ,J	< 0.1 ,J	6.2 ,J	< 0.1 ,J	< 0.1	< 0.1 ,J	< 0.1
Metals								
ARSENIC (AS) TOTAL	0.325 E	0.0266	0.0213	0.0482	0.0261	0.0173	0.0223	0.0054
ARSENIC (AS) DIS								
CADMIUM (CD) TOTAL		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
CADMIUM (CD) DIS								
SELENIUM (SE) TOTAL	0.0247 B	0.0056 ,U	0.0054 ,U	< 0.005	0.048	< 0.005	0.0066 ,U	< 0.005
SELENIUM (SE) DIS								

TABLE 4. Results from FMC's 2Q2009 Routine Calciner Pond, CERCLA and RCRA Groundwater Monitoring Program Wells

Parameter **Routine Analytes**	WELL-174	WELL-177	WELL-178	WELL-180	WELL-183	WELL-189	WELL-190
Field Measurements							
DEPTH TO WATER LEVEL (FEET)	49.02	47.16	53.4	55.45	99.51	166.95	146.75
FLOW (CFS)							
PH (FLD)	7.44	7.42	7.14	7.27	7.45	5.96	6.61
SC (UMHOS/CM AT 25 C) (FLD)	1309	1167	3898	1796	917	5752	1699
OXIDATION REDUCTION POTENTIAL						87.9	128.2
OXYGEN (O) (FLD) DIS	4.94	4.04	2.97	2.58	4.71	0.13	2.69
TURBIDITY (NTU) (FLD)	0.5	0.4	0.6	0.5	0.5	6.7	0.9
WATER TEMPERATURE (C) (FLD)	16.9	17.2	15.5	13.6	16	18.3	16.7
General WQP							
POTASSIUM (K) TOT	12.1	12.5	25	35.8	10.2 J	56.4 E,J	4.6 E,J
POTASSIUM (K) DIS							
SULFATE (SO4)	99.4	70.6	542	190	126	3210	268
CHLORIDE (CL)	209	180	877	175	139	168 ,J	267 ,J
FLUORIDE (F)	0.7	0.7	0.2	0.5	0.4	0.3	1.2
TOTAL AMMONIA (NH3+NH4 AS N)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	1.6	0.1 ,J
NITRATE (NO3-N)	4.5	3.8	4.7	31.3	1.4	2.2	9.4
ELEMENTAL PHOSPHORUS					< 0.00005		
TOTAL PHOSPHORUS							
PHOSPHORUS TOT (6020)						129 NE,J	0.629 NE,J
PHOSPHORUS DIS (6020)							
ORTHOPHOSPHATE (PO4-P)	< 0.1	< 0.1	< 0.1	0.2 ,J	< 0.1 ,J		
Metals							
ARSENIC (AS) TOTAL	0.0037 ,J	0.0042 ,J	0.0093	0.0364	0.016	0.657 E	0.0111 BE,J
ARSENIC (AS) DIS							
CADMIUM (CD) TOTAL	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001		
CADMIUM (CD) DIS							
SELENIUM (SE) TOTAL	0.0055 ,U	0.0072 ,U	0.0066 ,U	0.0071 ,U	0.0082 ,U	0.0491 B	0.0208
SELENIUM (SE) DIS							

TABLE 4. Results from FMC's 2Q2009 Routine Calciner Pond, CERCLA and RCRA Groundwater Monitoring Program Wells

Parameter **Routine Analytes**	WELL-502	WELL-515	WELL-517	WELL-523	WELL-524	WELL-525
Field Measurements						
DEPTH TO WATER LEVEL (FEET)	56.44	56.95	59.72	56.66	16.71	16.34
FLOW (CFS)						
PH (FLD)	7.41	7.3	7.13	7.24	7.45	7.51
SC (UMHOS/CM AT 25 C) (FLD)	638	1184	1482	879	501	516
OXIDATION REDUCTION POTENTIAL	79.8	50.1			91.5	82.5
OXYGEN (O) (FLD) DIS	7.21	3.95	3.74	3.58	6.51	7.06
TURBIDITY (NTU) (FLD)	0.5	0.8	0.4	0.4	0.4	0.4
WATER TEMPERATURE (C) (FLD)	12.5	13.6	14.5	13.7	12.8	12.1
General WQP						
POTASSIUM (K) TOT	5.77 NE,J	6.84 NE,J	37.9 NE,J	6.69 NE,J	3.4 NE,J	3.71 NE,J
POTASSIUM (K) DIS						
SULFATE (SO4)	68.4	148	168	62.3	45.4	48.8
CHLORIDE (CL)	48	186	202 ,J	124 ,J	20.6 ,J	22.5 ,J
FLUORIDE (F)	0.9	0.8	0.2	0.5	0.7	0.7
TOTAL AMMONIA (NH3+NH4 AS N)	0.3 ,U	0.3 ,U	< 0.2	< 0.2	< 0.2	< 0.2
NITRATE (NO3-N)	2.6	3.2	9.9	4.8	1.7	1.9
ELEMENTAL PHOSPHORUS						
TOTAL PHOSPHORUS						
PHOSPHORUS TOT (6020)	0.0439 BN,U,J	0.0464 BN,U,J	0.584 E	0.0265 BE,U,J	0.0272 BE,U,J	0.0366 BE,U,J
PHOSPHORUS DIS (6020)						
ORTHOPHOSPHATE (PO4-P)						
Metals						
ARSENIC (AS) TOTAL	0.0044 B,J	0.0056 B,J	0.0257	0.0019 B,U,J	0.00086 B,U,J	0.0019 B,U,J
ARSENIC (AS) DIS						
CADMIUM (CD) TOTAL						
CADMIUM (CD) DIS						
SELENIUM (SE) TOTAL	0.0008 BN,J	0.0011 BN,J	0.0142	0.0023 B,U,J	0.0008 B,U,J	0.00049 B,U,J
SELENIUM (SE) DIS						

TABLE 4. Results from FMC's 2Q2009 Routine Calciner Pond, CERCLA and RCRA Groundwater Monitoring Program Wells

Parameter **Routine Analytes**	BATISTE SPRING	TW-11S	TW-12S	TW-9S
Field Measurements				
DEPTH TO WATER LEVEL (FEET)		41.81	51.62	64.22
FLOW (CFS)	2.45			
PH (FLD)	6.7	7.33	6.63	6.94
SC (UMHOS/CM AT 25 C) (FLD)	1084	639	890	1401
OXIDATION REDUCTION POTENTIAL			27.1	
OXYGEN (O) (FLD) DIS	1.41	6.46	0.24	0.19
TURBIDITY (NTU) (FLD)	0.3	6.1	7.6	5.9
WATER TEMPERATURE (C) (FLD)	13.4	12.3	14.5	14.2
General WQP				
POTASSIUM (K) TOT	13.6	3.67 NE	9.6 NE,J	40.2 NE,J
POTASSIUM (K) DIS				
SULFATE (SO4)	160 ,J	52	174	194
CHLORIDE (CL)	58.4	24.2 ,J	49.7 ,J	185 ,J
FLUORIDE (F)	0.4	0.7	1.4	< 0.1
TOTAL AMMONIA (NH3+NH4 AS N)	1	< 0.2	0.4	< 0.2
NITRATE (NO3-N)	8	2.1	7.7	9.8
ELEMENTAL PHOSPHORUS				
TOTAL PHOSPHORUS				
PHOSPHORUS TOT (6020)		0.0319 BE	11.3 E	1.6 E
PHOSPHORUS DIS (6020)				
ORTHOPHOSPHATE (PO4-P)	20.7 ,J			
Metals				
ARSENIC (AS) TOTAL	0.0219	0.0012 B	0.0155	0.0239
ARSENIC (AS) DIS				
CADMIUM (CD) TOTAL	< 0.001			
CADMIUM (CD) DIS				
SELENIUM (SE) TOTAL	< 0.005	0.0012 B	0.0052	0.0057
SELENIUM (SE) DIS				

Table 5. Results for FMC 2Q2009 Special Shallow/Deep Well Pair Sampling and Analysis Event

Parameter	WELL-103 (Deep)	WELL-104 (Shallow)	WELL-107 (Deep)	WELL-108 (Shallow)	WELL-109 (Deep)	WELL-110 (Shallow)
Field Measurements						
DEPTH TO WATER LEVEL (FEET)	89.33	89.88	87.92	89.35	61.08	65.64
FLOW (CFS)						
PH (FLD)	7.34	7.34	6.88	7.07	7.33	6.95
SC (UMHOS/CM AT 25 C) (FLD)	680	2257	1452	2443	756	1370
OXIDATION REDUCTION POTENTIAL	254.9					
OXYGEN (O) (FLD) DIS	0.06	0.14	2.99	3.93	5.33	1.81
TURBIDITY (NTU) (FLD)	0.7	0.6	0.6	0.5	0.6	0.5
WATER TEMPERATURE (C) (FLD)	15.7	14.6	18.3	18.8	14.7	16.9
General WQP						
POTASSIUM (K) TOT	13.3 NE,J	251 J	9.57 NE,J	110 J	5.34 NE,J	18.4 NE,J
POTASSIUM (K) DIS						
SULFATE (SO4)	40.3	163	247	231	80.9	208
CHLORIDE (CL)	72.2	168	86.8 ,J	377	43.3 ,J	106 ,J
FLUORIDE (F)	0.3	3.8	0.5	0.4	0.8	0.4
TOTAL AMMONIA (NH3+NH4 AS N)	0.1 ,U	2.9	< 0.2	< 0.2	< 0.2	< 0.2
NITRATE (NO3-N)	0.4	25.9	1.4	15.8	1.2	4.2
ELEMENTAL PHOSPHORUS			< 0.00005	0.028		
TOTAL PHOSPHORUS				1 ,J		
PHOSPHORUS TOT (6020)	0.414 N,J		0.06 E,U,J		0.0383 BE,U,J	1.36 E
PHOSPHORUS DIS (6020)						
ORTHOPHOSPHATE (PO4-P)		2.2 ,J		2.1 ,J		
Metals						
ARSENIC (AS) TOTAL	0.0558	0.0403	0.0012 ,U,J	0.0167	0.002 B,U,J	0.0369
ARSENIC (AS) DIS						
CADMIUM (CD) TOTAL		< 0.001		< 0.001		
CADMIUM (CD) DIS						
SELENIUM (SE) TOTAL	0.0035 BN,J	0.0064 ,U	0.0035 ,U,J	0.0108 ,U	0.0013 B,U,J	0.0251
SELENIUM (SE) DIS						

Table 5. Results for FMC 2Q2009 Special Shallow/Deep Well Pair Sampling and Analysis Event

Parameter	WELL-125 (Deep)	WELL-126 (Shallow)	WELL-130 (Deep)	WELL-137 (Shallow)	WELL-133 (Deep)	WELL-134 (Shallow)
Field Measurements						
DEPTH TO WATER LEVEL (FEET)	59.27	59.42	73.43	74.08	84.28	83.82
FLOW (CFS)						
PH (FLD)	7.53	7.54	7.45	7.41	6.72	6.75
SC (UMHOS/CM AT 25 C) (FLD)	576	878	568	1048	1765	2803
OXIDATION REDUCTION POTENTIAL	121.2		108.4	164.7	108.1	150.5
OXYGEN (O) (FLD) DIS	5.1	4.34	4.17	4.68	2.66	0.11
TURBIDITY (NTU) (FLD)	0.8	0.3	0.6	0.6	0.5	0.7
WATER TEMPERATURE (C) (FLD)	17.9	16.4	15.1	13.5	18.5	16.9
General WQP						
POTASSIUM (K) TOT	6.99 NE,J	10.6	7.59 NE,J	6.43 NE,J	23.5 NE,J	232 NE,J
POTASSIUM (K) DIS						
SULFATE (SO4)	41.8	89.8 ,J	31.5	88.7	503	376
CHLORIDE (CL)	39.2	98.2	49.8	173	97.4	394
FLUORIDE (F)	1.2	0.9	0.5	0.3	0.3	0.1
TOTAL AMMONIA (NH3+NH4 AS N)	0.5 ,U	< 0.2	0.5 ,U	0.6 ,U	0.6 ,U	1 ,U
NITRATE (NO3-N)	0.9	2	0.7	6.5	1.5	22.1
ELEMENTAL PHOSPHORUS						
TOTAL PHOSPHORUS						
PHOSPHORUS TOT (6020)	0.0301 BN,U,J		0.219 N,U,J	1.13 N,J	0.0476 BN,U,J	29.9 N,J
PHOSPHORUS DIS (6020)						
ORTHOPHOSPHATE (PO4-P)		< 0.1 ,J				
Metals						
ARSENIC (AS) TOTAL	0.0067 B,J	0.009	0.0328 ,J	0.0874	0.0081 B,J	0.144
ARSENIC (AS) DIS						
CADMIUM (CD) TOTAL		< 0.001				
CADMIUM (CD) DIS						
SELENIUM (SE) TOTAL	0.00063 BN,J	0.0041 ,U,J	0.0025 BN,J	0.0035 BN,J	0.0053 BN,J	0.009 BN,J
SELENIUM (SE) DIS						

Table 5. Results for FMC 2Q2009 Special Shallow/Deep Well Pair Sampling and Analysis Event

Parameter	WELL-144 (Deep)	WELL-145 (Shallow)	TW-5D (Deep)	TW-5S (Shallow)
Field Measurements				
DEPTH TO WATER LEVEL (FEET)	85.84	85.85	80.89	81.69
FLOW (CFS)				
PH (FLD)	6.42	6.03	7.41	6.9
SC (UMHOS/CM AT 25 C) (FLD)	2772	5610	815	2242
OXIDATION REDUCTION POTENTIAL	147	98.6		-68.3
OXYGEN (O) (FLD) DIS	0.16	0.07	4.57	0.22
TURBIDITY (NTU) (FLD)	2.4	3.6	2.9	100
WATER TEMPERATURE (C) (FLD)	16.3	15.5	17.3	17.3
General WQP				
POTASSIUM (K) TOT	15.9 NE,J	64.6 E,J	9.8 NE,J	87.1 NE,J
POTASSIUM (K) DIS				106 NE,J
SULFATE (SO4)	965 ,J	2960	128	328
CHLORIDE (CL)	132	175	46.9 ,J	346
FLUORIDE (F)	0.6	0.4	0.8	0.1
TOTAL AMMONIA (NH3+NH4 AS N)	0.1 ,J	3.9	< 0.2	0.1 ,U
NITRATE (NO3-N)	2.2	3.4	0.8	21.5
ELEMENTAL PHOSPHORUS				
TOTAL PHOSPHORUS				
PHOSPHORUS TOT (6020)	0.165 N,U,J	87.1 NE,J	0.0253 BE,U,J	11.1 NE,J
PHOSPHORUS DIS (6020)				6.48 N,J
ORTHOPHOSPHATE (PO4-P)				
Metals				
ARSENIC (AS) TOTAL	0.0022 B,J	0.483 E	0.0027 B,U,J	0.0684 BN
ARSENIC (AS) DIS				0.0486 B,J
CADMIUM (CD) TOTAL				
CADMIUM (CD) DIS				
SELENIUM (SE) TOTAL	0.0103 N,J	0.0825	0.002 B,U,J	0.0149 BN,J
SELENIUM (SE) DIS				0.0145 N,J

Table 6. Comparison of 2Q2009 Deep Well Results with 1993-1994 (EMF RI) Mean Results

Parameter	WELL-103 (Deep) 2Q2009	WELL-103 (Deep) 1993-1994 mean	WELL-107 (Deep) 2Q2009	WELL-107 (Deep) 1993-1994 mean	WELL-109 (Deep) 2Q2009	WELL-109 (Deep) 1993-1994 mean
Field Measurements						
PH (FLD)	7.34	7.07	6.88	7.39	7.33	7.47
SC (UMHOS/CM AT 25 C) (FLD)	680	1112	1452	634	756	509
OXIDATION REDUCTION POTENTIAL	254.9	209		59		116
OXYGEN (O) (FLD) DIS	0.06	NC	2.99	NC	5.33	NC
TURBIDITY (NTU) (FLD)	0.7	NC	0.6	NC	0.6	NC
WATER TEMPERATURE (C) (FLD)	15.7	14.1	18.3	19.5	14.7	15.1
General WQP						
POTASSIUM (K) TOT	13.3 NE,J	13.2	9.57 NE,J	8.42	5.34 NE,J	6.13
POTASSIUM (K) DIS						
SULFATE (SO4)	40.3	108	247	66.4	80.9	58.5
CHLORIDE (CL)	72.2	122	86.8 ,J	46	43.3 ,J	35.1
FLUORIDE (F)	0.3	0.18	0.5	0.6	0.8	0.83
TOTAL AMMONIA (NH3+NH4 AS N)	0.1 ,U	0.43	< 0.2	0.37	< 0.2	0.35
NITRATE (NO3-N)	0.4	0.82	1.4	0.86	1.2	0.92
ELEMENTAL PHOSPHORUS	NA	NA	< 0.00005	NA	NA	NA
TOTAL PHOSPHORUS	0.414 N,J	1.89	0.06 E,U,J	0.08	0.0383 BE,U,J	0.08
Metals						
ARSENIC (AS) TOTAL	0.0558	0.0351	0.0012 ,U,J	0.0059	0.002 B,U,J	0.0034
SELENIUM (SE) TOTAL	0.0035 BN,J	0.0028	0.0035 ,U,J	0.0022	0.0013 B,U,J	0.0018

NOTES:
NC means not calculated.
NA means not analyzed.

Table 6. Comparison of 2Q2009 Deep Well Results with 1993-1994 (EMF RI) Mean Results

Parameter	WELL-125 (Deep) 2Q2009	WELL-125 (Deep) 1993-1994 mean	WELL-130 (Deep) 2Q2009	WELL-130 (Deep) 1993-1994 mean	WELL-133 (Deep) 2Q2009	WELL-133 (Deep) 1993-1994 mean
Field Measurements						
PH (FLD)	7.53	7.46	7.45	7.25	6.72	7.31
SC (UMHOS/CM AT 25 C) (FLD)	576	538	568	773	1765	788
OXIDATION REDUCTION POTENTIAL	121.2	91	108.4	216	108.1	106
OXYGEN (O) (FLD) DIS	5.1	NC	4.17	NC	2.66	NC
TURBIDITY (NTU) (FLD)	0.8	NC	0.6	NC	0.5	NC
WATER TEMPERATURE (C) (FLD)	17.9	17.9	15.1	14.1	18.5	18.5
General WQP						
POTASSIUM (K) TOT	6.99 NE,J	8.7	7.59 NE,J	10	23.5 NE,J	13.3
POTASSIUM (K) DIS						
SULFATE (SO4)	41.8	43	31.5	61	503	129.8
CHLORIDE (CL)	39.2	33	49.8	87	97.4	51
FLUORIDE (F)	1.2	1.16	0.5	0.28	0.3	0.52
TOTAL AMMONIA (NH3+NH4 AS N)	0.5 ,U	0.37	0.5 ,U	0.39	0.6 ,U	0.35
NITRATE (NO3-N)	0.9	0.63	0.7	37.55	1.5	10.13
ELEMENTAL PHOSPHORUS	NA	NA	NA	NA	NA	NA
TOTAL PHOSPHORUS	0.0301 BN,U,J	0.08	0.219 N,U,J	0.73	0.0476 BN,U,J	14.09
Metals						
ARSENIC (AS) TOTAL	0.0067 B,J	0.0062	0.0328 ,J	0.0305	0.0081 B,J	0.01
SELENIUM (SE) TOTAL	0.00063 BN,J	0.0018	0.0025 BN,J	0.004	0.0053 BN,J	0.0017

NOTES:
NC means not calculated.
NA means not analyzed.

Table 6. Comparison of 2Q2009 Deep Well Results with 1993-1994 (EMF RI) Mean Results

Parameter	WELL-144 (Deep) 2Q2009	WELL-144 (Deep) 1993-1994 mean	TW-5D (Deep) 2Q2009	TW-5D (Deep) 1993-1994 mean
Field Measurements				
PH (FLD)	6.42	6.94	7.41	7.5
SC (UMHOS/CM AT 25 C) (FLD)	2772	1756	815	591
OXIDATION REDUCTION POTENTIAL	147	229	NA	-29
OXYGEN (O) (FLD) DIS	0.16	NC	4.57	NC
TURBIDITY (NTU) (FLD)	2.4	NC	2.9	NC
WATER TEMPERATURE (C) (FLD)	16.3	15.3	17.3	16.5
General WQP				
POTASSIUM (K) TOT	15.9 NE,J	15.1	9.8 NE,J	10.4
POTASSIUM (K) DIS				
SULFATE (SO4)	965 ,J	396	128	47
CHLORIDE (CL)	132	149	46.9 ,J	41.6
FLUORIDE (F)	0.6	0.46	0.8	0.87
TOTAL AMMONIA (NH3+NH4 AS N)	0.1 ,J	0.35	< 0.2	0.5
NITRATE (NO3-N)	2.2	3.76	0.8	0.87
ELEMENTAL PHOSPHORUS	NA	NA	NA	NA
TOTAL PHOSPHORUS	0.165 N,U,J	1.1	0.0253 BE,U,J	0.03
Metals				
ARSENIC (AS) TOTAL	0.0022 B,J	0.0064	0.0027 B,U,J	0.0056
SELENIUM (SE) TOTAL	0.0103 N,J	0.0134	0.002 B,U,J	0.0021

NOTES:
NC means not calculated.
NA means not analyzed.

LEGEND

- RCRA PROGRAM WELLS
- CERCLA PROGRAM WELLS
- CALCINER POND PROGRAM WELLS

AREA NORTH OF I-86
NORTHERN FMC PROPERTIES
FMC PLANT
WESTERN PONDS AREA
CENTRAL PLANT AREA
SIMPLOT FACILITY
SIMPLOT GYPSUM STACK
JOINT FENCELINE AREA
BANNOCK PAVING AREA
18 CELL B CLOSED BY REMOVAL
18 CELL A
SLAG PILE
SLAG PILE
LANDFILL
IDAHO POWER
KINPORT SUBSTATION SITE
PIT
BATISTE SPRING
SWANSON ROAD SPRING
CULVERT
DRAG STRIP
RAILROAD SWALE
FURNACE BUILDING
SUBSTATION
TANKS
TANKS
TANKS
TANKS
Portneuf River
I-86
I-86
I-86
30
30
S,30
OPH
NPH

SCALE (In Feet) 0 1000

NORTH

FMC CORPORATION–POCATELLO, IDAHO FMC PLANT OU GROUNDWATER CURRENT CONDITIONS REPORT 2008	**FMC ROUTINE GROUNDWATER MONITORING WELL NETWORK 2009**
	FIGURE **1**

UPDATE TIME: 3:40PM
LT \HEL\041509\I:\Land Projects\1303b201\dwg\1303b201h109.dwg

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LEGEND

- RCRA PROGRAM WELLS
- CERCLA PROGRAM WELLS
- CALCINER POND PROGRAM WELLS
- SHALLOW/DEEP WELL PAIRS FOR 2Q09 SPECIAL EVENT

AREA NORTH OF I-86
I-86
PIT
BATISTE SPRING
SWANSON ROAD SPRING
TW-11S
TW-11I
TW-22S
CULVERT
NORTHERN FMC PROPERTIES
DRAG STRIP
OPH
NPH
RAILROAD SWALE
TW-9S
TW-8S
TW-7S
TANKS
Portneuf River
U.S. 30
FURNACE BUILDING
TW-5D
TW-5I
TW-5S
TW-2S
TW-2I
TW-2D
FMC-6
FMC-7
FMC PLANT
SLAG PIT
SUBSTATION
TW-4I
TW-4D
FMC-4
SIMPLOT FACILITY
FMC-3
BANNOCK PAVING AREA
WESTERN PONDS AREA
CENTRAL PLANT AREA
FMC-5
TW-3D
TW-3S
18 CELL B CLOSED BY REMOVAL
18 CELL A
SLAG PILE
JOINT FENCELINE AREA
SIMPLOT GYPSUM STACK
TW-10S
IDAHO POWER
KINPORT SUBSTATION SITE
LANDFILL

NORTH

SCALE
0 (In Feet) 1000

FMC CORPORATION–POCATELLO, IDAHO FMC PLANT OU GROUNDWATER CURRENT CONDITIONS REPORT 2008	**SHALLOW/DEEP WELL PAIRS FOR 2Q09 SPECIAL EVENT**	**FIGURE** **2**

UPDATE TIME: 4:18PM
LT \HEL\041509\I:\Land Projects\1303b201\dwg\1303b201h110.dwg

Hydrometrics, Inc.
Consulting Scientists and Engineers

LEGEND

- 147 / 4397.16 — SHALLOW MONITORING WELL AND GROUNDWATER ELEVATION
- POTENTIOMETRIC CONTOUR 10 FOOT INTERVAL
- POTENTIOMETRIC CONTOUR 1 FOOT INTERVAL

NOTE:

ALL ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL.

AREA NORTH OF I-86
NORTHERN FMC PROPERTIES
WESTERN PONDS AREA
FMC PLANT
SLAG PILE
SLAG PILE
LANDFILL
KINPORT SUBSTATION SITE
TANKS
TANKS
TANKS
TANKS
SIMPLOT FACILITY
SIMPLOT GYPSUM STACK
FORMER CALCINER POND SEDIMENT STORAGE AREA
FORMER UNLINED CALCINER POND
JOINT FENCELINE AREA
FORMER KILN SCRUBBER OVERFLOW POND
FORMER KILN SCRUBBER PONDS
PCB STORAGE SHED
CENTRAL PLANT AREA
OLD PRECIPITATOR DUST
TRANSFORMER AREA
BANNOCK PAVING AREA
WASTE OIL STORAGE AREA
CHEMICAL LAB DRAINPIT
SLAG PIT SUMP
SLAG PIT
RAILROAD SWALE
DRAG STRIP
FURNACE BUILDING
NWW DITCH
BATISTE SPRING
SWANSON ROAD SPRING
CULVERT
PIT
Portneuf River
I-86
U.S. 30

147	4397.16
148	4397.03
176	4397.55
177	4397.79
175	4397.95
154	4397.47
179	4397.74
174	4398.10
178	4397.68
173	4397.82
180	4397.32
170	4397.31
102	4397.08
101	4397.11
169	4398.20
149	4397.04
181	4397.84
171	4397.07
182	4398.15
172	4397.19
523	4396.32
515	4393.40
514	4395.47
501	4394.74
516	4385.51
502	4384.86
525	4383.27
503	4384.21
505	4384.55
TW-11S	4384.43
TW-12S	4384.66
518	4384.50
TW-9S	4386.01
517	4384.73
110	4384.93
146	4390.04
111	4392.97
TW-5S	4393.46
122	4393.39
108	4393.05
123	4393.14
145	4392.41
190	4392.82
189	4393.77
112	4395.23
134	4395.11
121	4394.51
143	4393.78
126	4396.55
127	4396.49
140	4395.85
159	4396.00
141	4395.78
155	4395.74
106	4395.91
190	4394.81
151	4395.66
157	4396.35
156	4396.58
120	4396.54
128	4396.50
139	4396.24
155	4396.56
124	4396.86
101	4396.43
104	4396.83
166	4396.49
168	4396.49
115	4396.54
116	4396.39
158	4397.48
182	4397.82
113	4396.73
114	4396.66
137	4397.05
167	4397.95
165	4396.96
142	4420.44
164	4434.43
191	4420.08
161	4559.76

NORTH

SCALE (In Feet) 0 1000

FMC CORPORATION-POCATELLO, IDAHO	**SHALLOW GROUNDWATER CONTOUR MAP MAY 2009**	FIGURE 3

UPDATE TIME: 11:12 AM
SPLETTENBERG\HEL\20090714\I:\LAND PROJECTS\1303B201\DWG\1303B201H112.DWG

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Figure 4. Arsenic Concentrations (mg/l) at Wells 134 and 159

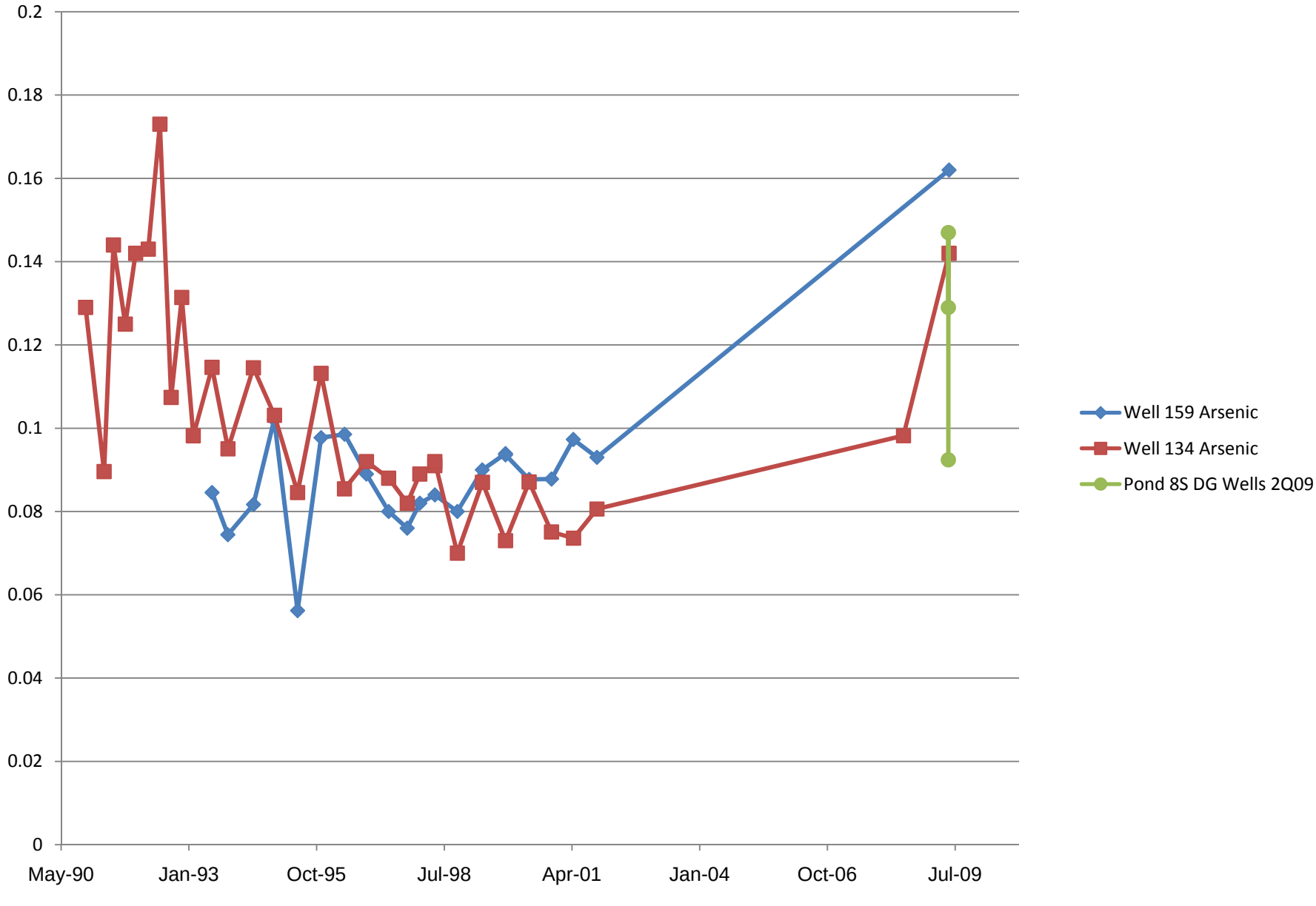


Figure 5. Potassium Concentrations (mg/l) at Wells 134 and 159

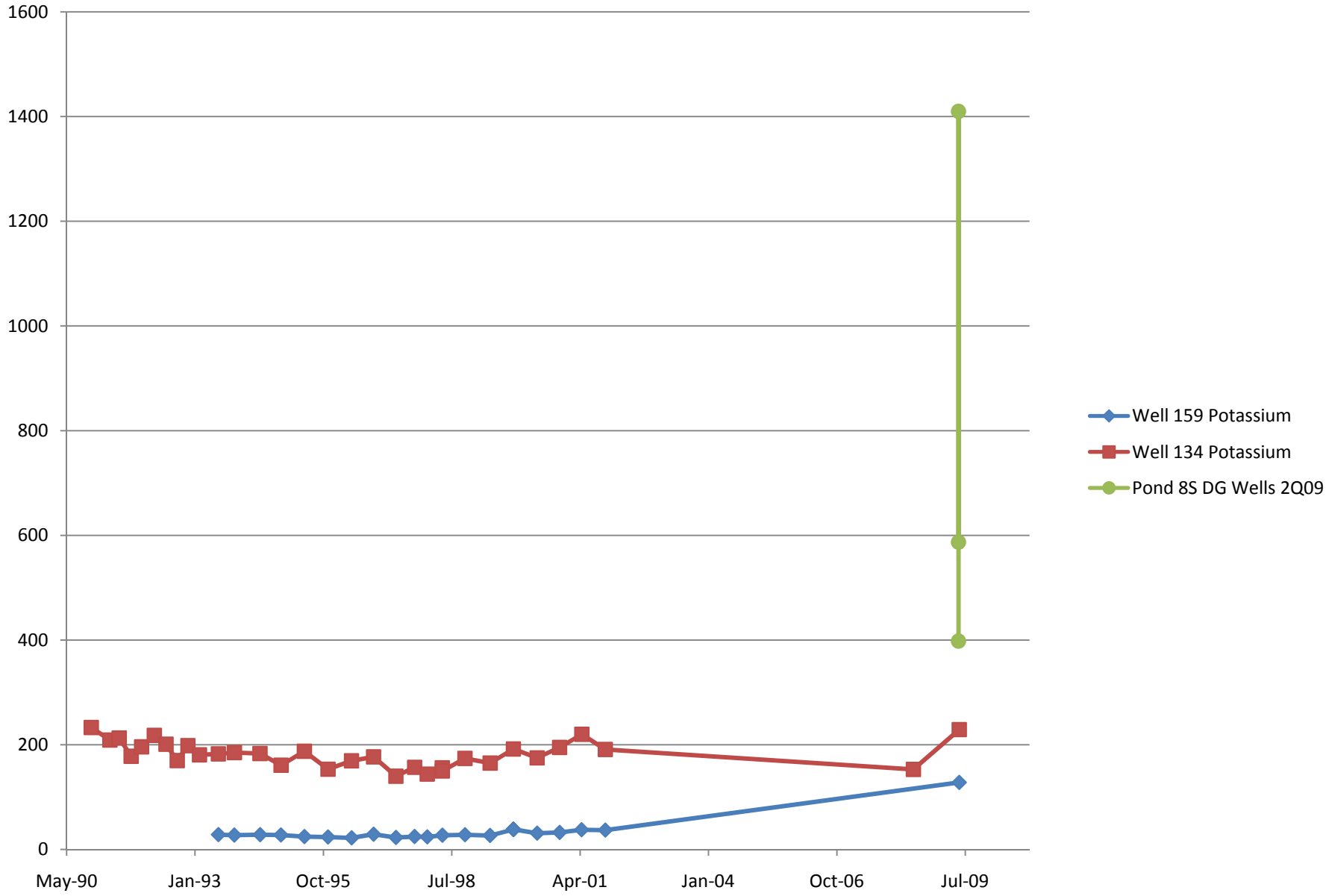
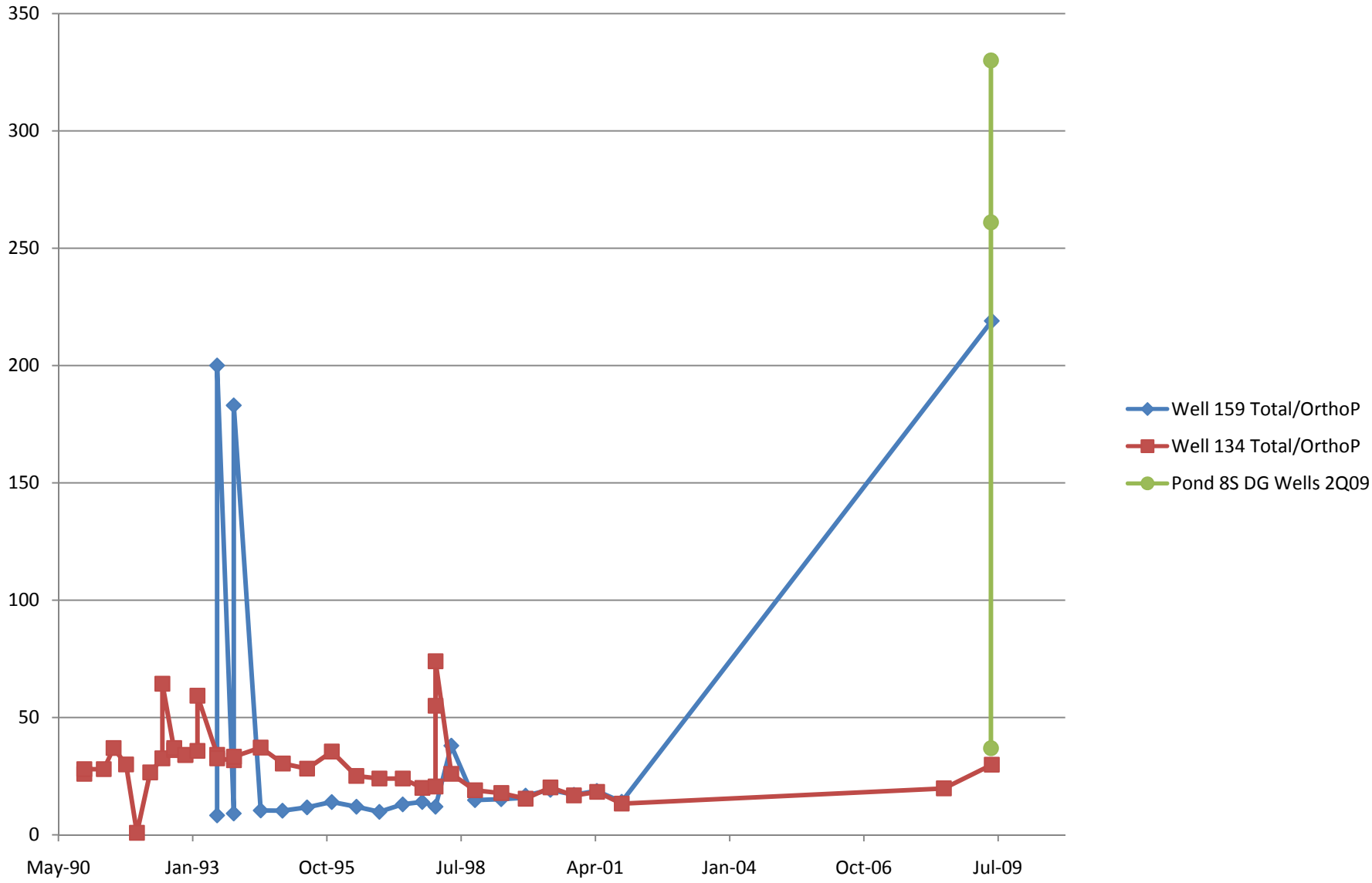


Figure 6. Total P / Orthophosphate Concentrations (mg/l) at Wells 134 and 159



ATTACHMENT 1

INTERIM CERCLA MONITORING WELL GROUNDWATER QUALITY DATABASE

ATTACHMENT 2

INTERIM CERCLA 2009 DATA VALIDATION AND LABORATORY REPORTS